

WHITEPAPER

RESHORING PROTOTYPING AND PRODUCTION:

A PRACTICAL GUIDE TO AVOID
SUPPLY CHAIN DISRUPTION



TABLE OF CONTENTS

▶	Introduction	3
▶	The Traditional Supply Chain	4
▶	The Catalysts: Pandemic, Politics, & Prices	4
▶	Supply Chain Diversification & Local Manufacturing	5
▶	Choosing a Local Production Partner	8
▶	Conclusion	8
▶	About Empire Group	9

Introduction

Overseas production has its benefits for many manufacturers, but this strategy is not without its issues. Transportation delays, trade regulations and tariffs, intellectual property concerns, and quality control are just a few of the major challenges of a global manufacturing approach. The impact of these issues on manufacturers' speed-to-market, product quality, and supply chain has been exacerbated by the pandemic, increasing headaches for those who manage design and engineering, prototyping, manufacturing operations, procurement and order fulfillment.

Over the last four years, the call to "bring manufacturing back home" has become increasingly audible. Even before Covid-19, reshoring became more attractive to U.S. manufacturers because of a trade war with China, tax incentives, and a lack of transparency in supply chains. Some companies seeking to mitigate risks, [like GE and Apple](#), have already taken steps to reshore or near-shore tooling production, component manufacturing, and assembly. The current macro-economic and political environments have accelerated this trend. A [recent survey by Thomas](#) indicates that 69% of manufacturers are "likely" to "extremely likely" to reshore in the future, a 28% increase over just a few months prior.

Issues with Offshore Supply Chains:

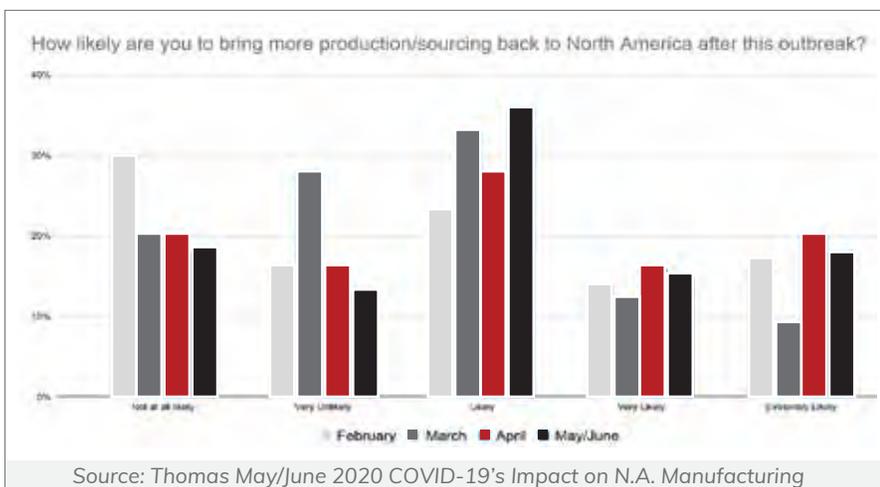
- Transportation delays
- Trade regulations and tariffs
- IP concerns
- Quality control & assurance
- Poor communication
- Lack of transparency

Impact on U.S. Manufacturers:

- Reduced speed-to-market
- Poor product quality
- Supply chain delays
- Operational headaches

Possible Solutions:

- Reshoring or nearshoring
- Hybrid sourcing
- Strategic local procurement

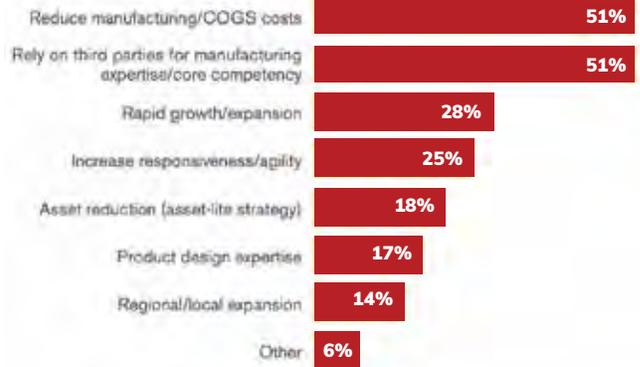


In this whitepaper, we'll explore this trend and provide insight into why and when it makes sense for U.S. manufacturers to reshore prototyping and production, and how companies can leverage the benefits of working with local design, prototype, and manufacturing partners during the pandemic and beyond.

The Traditional Supply Chain

The desire to reduce costs while leveraging third party manufacturing expertise is the key driver for U.S. manufacturers to outsource overseas. With access to inexpensive materials and cheap labor, manufacturing companies have thrived on the benefits associated with foreign production partners. Companies like Ford, Nike, and Cisco are well known for outsourcing their production overseas and have been rewarded with substantial reductions in the cost of goods sold and the price at the point of sale, helping to make them competitive giants. Simply put, outsourcing production overseas is a low-cost way to produce products so that consumers pay less and companies make more.

Main Reasons for Outsourcing Manufacturing



According to a report conducted by Peerless Research Group on behalf of Supply Chain Management Review, the primary reasons companies outsource their production included the cost of goods sold and the ability to leverage the knowledge and expertise that is not present internally.

Source: Peerless Research Group

The Catalysts: Pandemic, Politics, & Prices

Due to this low-cost labor and production, most manufacturers tolerate the additional transportation costs, complex logistics, and international tariffs associated with manufacturing overseas because they are justifiable in the end. However, in the past decade increases in the cost of fuel, shipping, and overseas labor, along with increasing political tension and tax incentives, have been catalysts in the movement to reshore production to the U.S. Add to that the unforeseen disruptions in supply and demand resulting from an unprecedented global pandemic, and you get the sudden tectonic shift towards regionalization and localization in manufacturing that we are experiencing today.

“COVID-19 has instilled new urgency for a restructuring of global supply chains on the grounds of operational resilience.”

— Swiss Re Institute, sigma No 6/2020

DRIVERS OF CHANGE

UNDERLYING DRIVERS

Diminishing Cost Arbitrage
(narrowing wage differentials)

Rising Political Risks
(ie. rising protectionism, trade war)

Social Values
(eg. equality, diversity & inclusion)

Increasing Cost of Business Disruption
(eg. natural catastrophes)

Technology
(robotics, 3D printing, digital manufacturing)

ACCELERATOR

COVID-19

SUPPLY CHAIN ADJUSTMENTS

Diversification
(geographic, suppliers)

Relocation/Parallel Supply Chains

Reshoring/Proximity to Customers

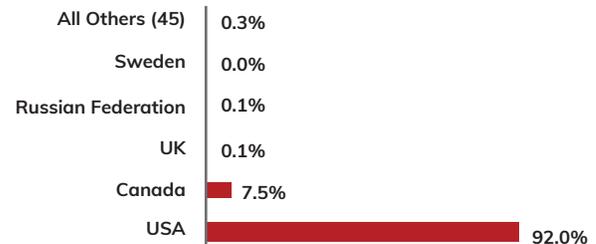
Simplified Supply Chains

Insurance & Risk Transfer Solutions

Source: Swiss Re Institute - sigma No 6/2020

In the wake of these recent events, U.S. manufacturers are scrambling to keep up with rapid changes in logistics, and weaknesses in their overseas supply chains are now being exposed. In a recent [supply chain analysis](#), Dun & Bradstreet found that over **"90 percent of businesses with direct impact to their supply chains from COVID shutdowns in China are headquartered in the USA."** The sectors hit hardest from these shutdowns are electronics, automotive, aerospace, medical devices, and semiconductors. Manufacturers affected include Fiat Chrysler, Ford Motors, Samsung Electronics, BASF, and the Boeing Co. These businesses are being forced to face a new reality, that is the risk of relying exclusively on overseas production has increased significantly.

DISTRIBUTION BY COUNTRY - COMPANIES WITH TIER 1 SUPPLIERS IN IMPACTED REGION

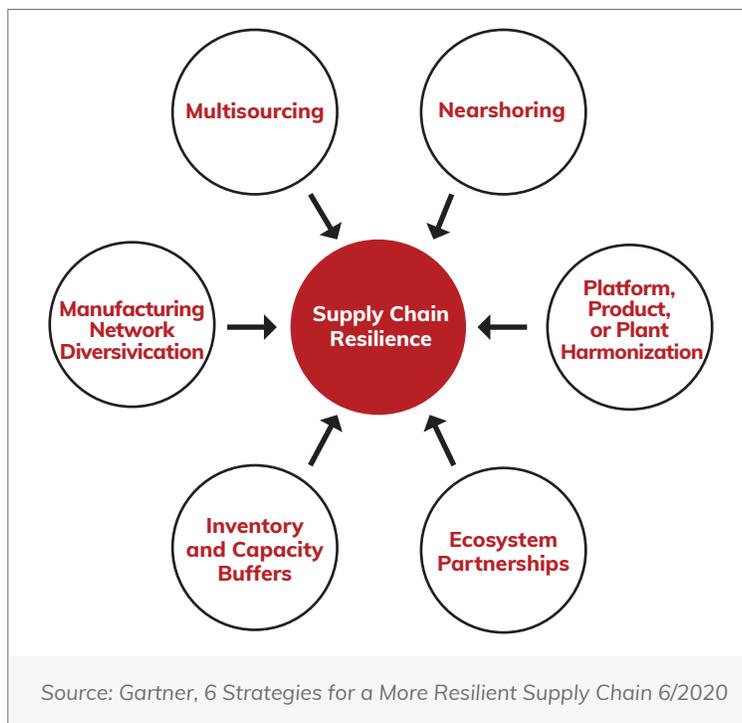


Source: Dun & Bradstreet Supply Chain Analytics (2/2020)

Supply Chain Diversification & Local Manufacturing

So, what are manufacturers doing about their supply chain issues amidst all this uncertainty? And what does this mean for those outsourcing industrial goods and services across the product development cycle? One path U.S. manufacturers are taking to mitigate future risk is supplier diversification. This diversification might mean rebuilding your supplier ecosystem through new local and foreign partnerships.

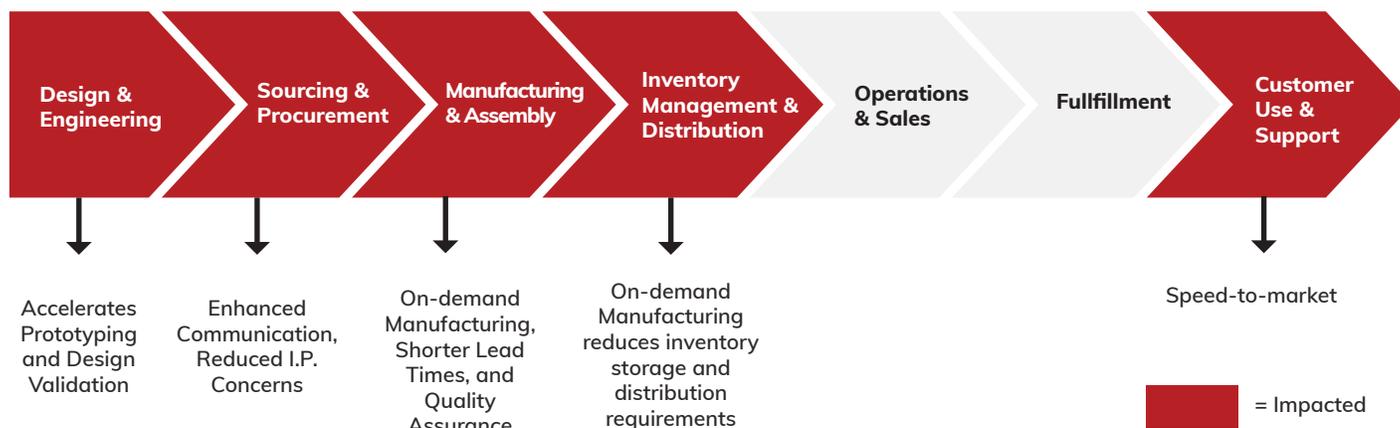
According to Gartner's [Six Strategies for a More Resilient Supply Chain](#), the Covid-19 crisis "has shown the need to have a diversified approach to sourcing." The article also states that "collaboration with strategic raw material suppliers and external service partners is vital to ensure better preparedness and resilience for the future." For companies without the scale to support multiple locations on their own, healthy relationships with contract manufacturers and global third party logistics (3PLs) can be vital in diversifying production and distribution.



WHERE & WHEN TO SOURCE LOCAL

Using a hybrid approach to diversify the supplier ecosystem, individuals responsible for sourcing goods and services in product development can effectively reduce dependency on any one geographic region and build resilience through a combination of foreign and domestic production partners. Ideally, these partners will be local job shops, service bureaus, and contract manufacturers with the knowledge, capacity, and speed to meet the quality companies expect from their foreign production partners while also adding significant value above and beyond expectation.

Local Provider Value Chain



With the "increased sophistication of components, manufacturing processes that require specialists, and the desire on the part of producers to have a more flexible capacity," as described in [an article by MIT Sloan Management Review](#), foreign suppliers are a less attractive option. And, since many of these projects are more likely to be labeled classified and have critical or valuable components that require excellence in communication, it is more suitable to keep this type of project close to the vest. This preference is especially true within highly competitive and regulated industries such as medical devices, defense, and consumer goods and electronics.

The most significant benefits of locally sourced industrial goods and services include:

- ▶ Drastically shorter delivery times
- ▶ Enhanced communication
- ▶ Reduced concerns over I.P. security
- ▶ Rapid response and iteration
- ▶ Direct shipments, and
- ▶ Quality assurance.

As such, engineers, purchasers, and operations professionals tasked with re-evaluating supplier relationships within highly competitive industries should begin to focus on reshoring projects that are:

- 1.** Strategic, high-value projects regardless of volume.
- 2.** Low-mid volume parts and components, where the benefit in cost overseas is not as compelling.
- 3.** Prototyping projects that require I.P. security, specialized knowledge, advanced technologies, or materials.
- 4.** Critical parts, components, or mass-customized products that would benefit from the flexibility of manufacturing locally on demand.

Establishing local ecosystem partnerships within the supply chain will be critical for product development, considering the challenges on the horizon. According to [a global survey by McKinsey & Company](#),

"Organizations that are successfully responding to the crisis have deployed more advanced technologies, digital products, and tech talent to speed up innovation—and they expect most of these changes to outlast the pandemic."

These are precisely the benefits local service bureaus can provide.

Choosing a Local Production Partner

When choosing local alternatives for supply, seek out onshore contract manufacturers, job shops, or service bureaus that:

- ✓ Co-create solutions and remain transparent in their processes,
- ✓ Are agile enough to manage change and shifting directions or deadlines quickly,
- ✓ Provide access to a broad range of services and expertise and can limit the extent of third-party involvement,
- ✓ Offer advanced technologies, like additive manufacturing, and incorporate them into the product development cycle,
- ✓ Have the capacity to allow for pivots in supply and production, and
- ✓ Maintain the highest level of excellence in communication at all levels of project management.

Finding a local provider that checks all these boxes will play a pivotal role in the success of product development amidst all the uncertainty manufacturers face, from maintaining timelines to keeping up with shifts in demand, from crisis management to long-term supply chain resiliency. Diversifying the supply chain to include local providers is now, and will continue to be, a competitive advantage.

Conclusion

We will forever remember 2020 as the year when overseas manufacturing came to an abrupt halt, and the global economy temporarily stood still. What began as a call to action to shift manufacturing back to the States became an immediate imperative for many companies with concentrated overseas production. The events of 2020 have provided the opportunity for manufacturers to re-evaluate their supply chain strategy and to create a proactive response for the future.

Now, at this precipice of change, how will your company move forward into the future, and what role will you play in its success? Will you continue to outsource overseas? Reshore production entirely? Opt for a hybrid strategy? And how will that choice impact your industry? Your product development? Your parts? By choosing to diversify your ecosystem partnerships to include both overseas and domestic providers, and by being strategic in what projects or parts design, engineering, and procurement teams will source locally, manufacturers will become more agile, resilient, and maintain a competitive edge.

About Empire Group

When excellence is required in product development and manufacturing, Empire Group is the go-to service provider on the East Coast. Centrally located in Greater Boston, MA, we are ideally positioned to service manufacturers in the North & South East U.S.

Empire Group is ISO 9001:2015 certified and ITAR compliant. These standards make us an excellent choice for manufacturers in highly competitive or regulated industries such as medical devices, defense, consumer goods, and electronics looking for services in design, engineering, prototype, or short-run production.

We offer a wide range of traditional and additive manufacturing technologies and materials and have the skills and expertise to meet your critical parts and components' performance requirements.

Our capabilities include:

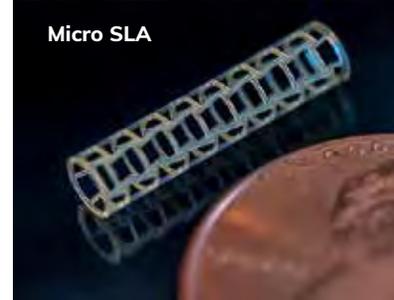
- ▶ Design and Engineering (DFM, DfAM, DFA)
- ▶ 3D printing (SLA, MJF, DLP, [Micro SLA](#), FDM, Polyjet, DMLS, SLS, [DCM](#)),
- ▶ CNC Machining,
- ▶ Prototype Fabrication,
- ▶ Painting & Finishing,
- ▶ Injection Molding,
- ▶ Urethane Casting,
- ▶ Metal Fabrication,
- ▶ Thermoforming and more.

Empire Group is a trusted provider of advanced manufacturing services for companies across all industries, large and small. Customers like General Dynamics Mission Systems, Raytheon, Cogmedix, SharkNinja, Keurig, and GE rely on Empire Group to deliver superior manufacturing services.

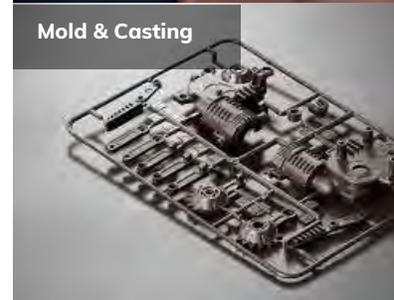
To learn more about Empire Group and how we can be a successful partner in your product development efforts, visit empiregroupusa.com or [book a meeting](#) with a member of our team.



Multi Jet Fusion



Micro SLA



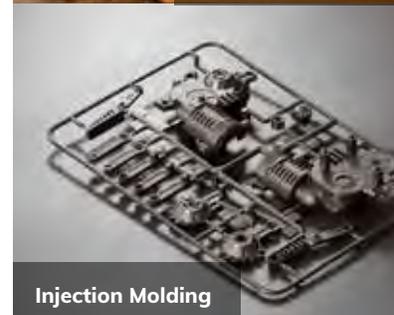
Mold & Casting



CNC Machining



3D Printed Mold Tool - Fortify DCM



Injection Molding

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