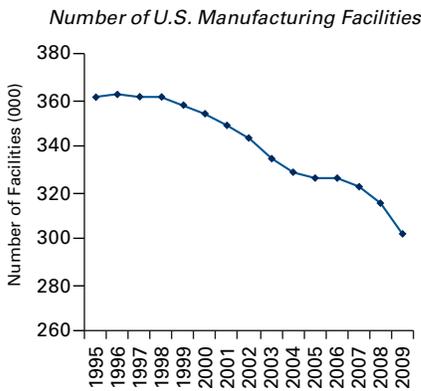


The Changing Landscape of U.S. Manufacturing:

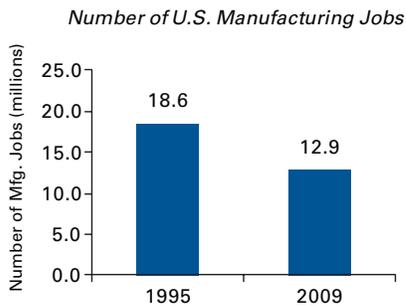
New ways of thinking about and managing supply chain performance

With 21 percent of U.S. manufacturers relocating production back or closer to North America,¹ and 40 percent of global demand being met by foreign manufacturers producing in the U.S.,² it is clear that many companies are rethinking their global manufacturing footprint.

A Period of Decline in U.S. Manufacturing



U.S. Census Bureau Statics Business Dynamics Statics: Number of Establishments



U.S. Census Bureau Statics Business Dynamics Statics: Number of Jobs

Trends driving reshoring back to the U.S.

The prevailing trend over the past 20 years has been the migration of manufacturing operations offshore, resulting in 34 percent fewer manufacturing plants and 7 million fewer manufacturing jobs in the U.S. today than there were 20 years ago.³ However, as recent headlines indicate, this trend appears to be abating, and many astute companies are refocusing efforts on growing and developing their U.S. manufacturing operations as part of a more globally diverse and balanced network.

- **NCR:** Bringing all production of ATMs back to the U.S. to be closer to its innovation center and to universities and vendors^{4 5}
- **Caterpillar:** Seeking a site in the U.S. for building a new factory for construction excavators⁶
- **GE:** Looking to onshore production of some water heaters beginning in 2011⁷
- **Procter & Gamble:** Begins operations in 2010 in its first new U.S. manufacturing plant in 40 years⁸
- The factors driving this trend towards increased onshoring include reduced benefits of labor cost differential, increased demand volatility, fluctuating oil prices, shrinking product life cycles, depreciation of the U.S. dollar, and increased product complexity. In addition, companies producing in low-cost countries continue to be dogged by product quality issues, reduced visibility, and threats to intellectual property. To effectively respond to these factors, supply chains must continually adapt, finding optimal solutions that balance cost, responsiveness and asset productivity.

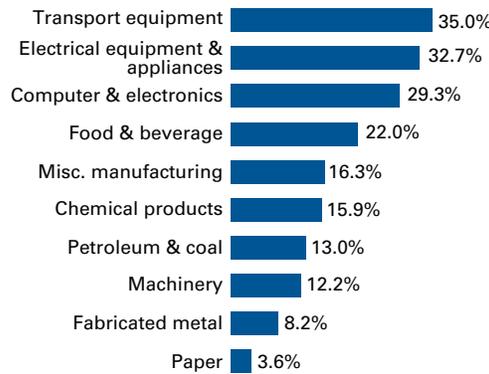
Factors driving change

As the pendulum begins to swing back to manufacturing in the U.S., a diverse set of companies are leading the way. These range from medium-sized to very large companies, U.S. and non-U.S.-based companies, and companies across industries. The main factors driving companies to reconsider U.S. manufacturing fall into five key areas: total landed cost, geographic and political risk, product life cycle and complexity, innovation, and intellectual property.

Total landed cost: Total landed cost consists of all costs required to position a product for sale to the consumer. These costs include labor, transportation, inventory carrying costs, insurance, taxes, tariffs, and others. Many of these costs are changing and thus reduce the benefits of offshore manufacturing. Most significantly, changes in overseas labor costs, logistics costs, and the value of the U.S. dollar reduce benefits of non-U.S. production.

Growth Industries in U.S. Manufacturing

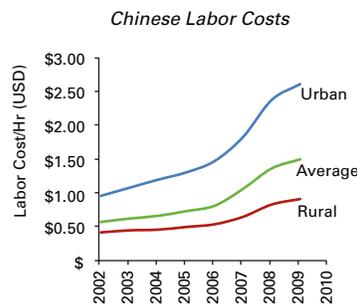
5-Year Growth Rate



Chinese labor costs continue to be a mere fraction of U.S. factory wages, but they have been rising by 15 percent per year since 2000,⁹ while U.S. inflation-adjusted labor rates have essentially remained flat.¹⁰ Thus, the single most alluring benefit of offshoring to China – labor cost differential – is likely to continue decreasing.

Shipping and logistics – another key cost driver of offshored supply chains – has risen 109 percent since 2006, as a result of both oil prices and imbalances in container supply and demand.¹¹ Political instability, limited global oil supply and escalating demand contribute to long-term higher costs for oil.

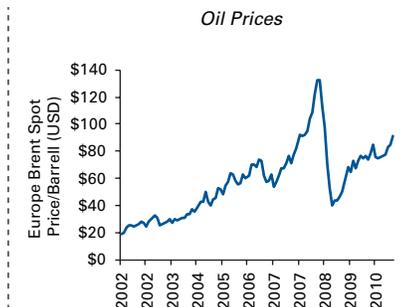
Factors that make offshoring less and less attractive



U.S. Bureau of Labor Statistics 2009 International Comparison of Hourly Manufacturing Labor Costs. 2009 Data estimated based on data published by China's National Bureau of Statistics



Federal Reserve System Board of Governors Nominal Broad Dollar Index History: 1995 to Present



U.S. Energy Information Administration 1987 – 2011 Monthly Europe Brent Spot Price Index

Geographic and political risk:

Offshored supply chains are subject to greater geographic and political risks. For example, the March 11, 2011, earthquake and tsunami devastated the northeast region of Japan, home to thousands of auto parts suppliers, and has caused severe disruptions in operations. These disruptions are now being felt by manufacturing plants abroad as the pre-tsunami inventories have been depleted. Toyota's India unit, Toyota Kirloskar Motor Pvt. Ltd., announced that it will cut production by 70 percent for at least five or six weeks due to parts shortages.¹² In addition, Ford Motor Company announced it will idle three plants in South Africa and Asia as a result of supply chain issues, and Honda Motor Company estimates that its global production fell 19.2 percent in March.¹³

The auto parts industry is not the only segment that has been adversely affected by the disaster. Texas Instruments anticipates four to six months of disruption to its Japanese chip manufacturing operations.¹⁴ And Panasonic announced that it expects to lose several billion dollars of revenue due to shortages of electronics parts, such as microcontrollers and condensers.¹⁵

Product life cycle and complexity:

In today's markets, consumers are demanding an ever-increasing variety of products. Take something as simple as spray-based household cleaning products. For decades consumers had only one packaging choice for aerosol products – large or small

steel cans. Today, the options have increased dramatically. Consumers can choose from aluminum versus steel cans of varying sizes; different non-CFC environmentally friendly propellants; and a variety of nonspray solutions, such as premoistened wipes and dust-collecting utensils like Swiffer® sweepers, all with a myriad of scents from lemon to rainforest. This increasing complexity places new demands on the supply chains that must manufacture and distribute these products. For example, manufacturers increasingly face decisions on whether it is more cost effective to make or to buy products. Greater visibility and access to demand data is not only more critical when trying to effectively manage store inventories with fewer shelf facings per unit of product, but also provides companies insight into consumer demand, which prompts them to revise products more frequently.

Innovation: Companies are beginning to recognize that the ability to sustain and improve innovation practices diminishes as product manufacturing is moved offshore.¹⁶ In October 2009, NCR made a move to bring innovative manufacturing back to the U.S.:

“Our decision to bring our North American ATM manufacturing in-house was driven by our belief that as self-service ATM technology becomes more innovative and strategic to financial institutions, the ability to control manufacturing in key markets becomes a core and competitive advantage to our growth strategy,” said Peter Dorsman, senior vice president of Global

Operations at NCR. “By in-sourcing the production of our SelfServ ATMs, we will decrease time-to-market, improve our internal collaboration, and lower our current operating costs.”¹⁷

Innovation has become an integral part of emerging manufacturing and supply chain strategies. Whether offshoring, reshoring, or remaining in the U.S., companies have realized that close collaboration between manufacturing and R&D are paramount to success.

Intellectual property: The FBI and U.S. Customs and Border Protection indicate that theft of intellectual property costs the U.S. economy \$250 billion per year and has resulted in the loss of 750,000 jobs.¹⁸ The laws governing intellectual property are often enforced less stringently in areas outside the U.S., leaving doors open for competitors and subcontractors to easily pirate manufacturing processes and product designs.¹⁹ While a large number of resources are being spent on this issue, U.S. lack of jurisdiction in other countries renders most efforts ineffective.

Considering moving manufacturing on-shore? A checklist to jump-start the decision-making process

“The challenge of history is to recover the past and introduce it to the present”
– David Thelen

With challenging economic conditions, volatility in commodity markets, and ongoing changes in both political and social climates, change has never been

as rapid and as well communicated as it is today . . . if only businesses had the time to pay attention to it! Ultimately, decisions by business leaders need to build off of today’s business environment to establish a path to the future.

Starting holistically, to drive success, the supply chain of the future must be:

- 1. Cost-effective and dynamic:** A supply chain must have a clear definition of core capabilities that utilizes both insourced and outsourced relationships to achieve lowest total delivered cost globally. Shifts in demand drive sourcing decisions across the network in order to respond quickly without compromising quality.
- 2. Flexible:** Product life cycles have shortened, and success is increasingly bimodal. A supply chain’s ability to scale up and down and accommodate more rapid change is critical.
- 3. Driven by analytics:** As visibility and access to demand data expands, companies have increased investments, not only in demand and supply planning systems, but in a wide range of analytical tools to evaluate expanded data sets and enable better decisions. This emergence of deeper analytics is increasingly being outsourced to experts who can perform sophisticated modeling and who have access to a broad array of data around demand drivers. The

result is improved planning, reduced investment in inventory and less expediting to meet demand spikes and unanticipated changes.

4. Innovation-friendly: Product innovations, private labels and alternate brands can be brought to market at lightning speed. Companies that are able to collaborate cross-functionally and cross-company achieve greater success in new product introductions.

5. Customized: The one-size-fits-all supply chain is a relic of the past. Supply chains of the future will be based on an integrated collection of assets to achieve the appropriate mix of delivered cost, responsiveness, inventory investment and speed to match customer needs.

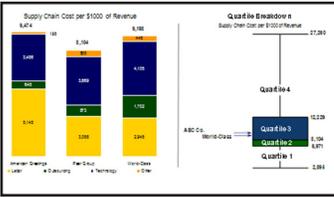
Manufacturing is fundamental to each of these required attributes. Because so many manufacturing network models exist and market forces are constantly changing, one standard set of solutions does not exist. This new reality is leading many companies to rethink their manufacturing strategies. Is your company in need? Perhaps asking these questions will help answer that question:

- How do the company's **capabilities compare** with competitors and best-in-class capabilities?
- What is the company's **core capability** in manufacturing?
- Does the **current mix of manufacturing assets align** with the

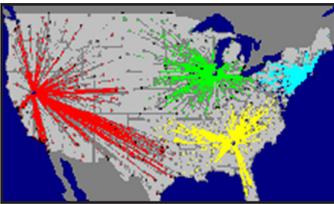
company's stated core capabilities?

- Has the company's **cost profile been benchmarked** and how does it compare to traditional and nontraditional competitors?
- Do the changes the company has made represent **incremental or step-changes**?
- Has the company clearly defined when to **invest in automation**?
- Does the company have a clear definition of which products should be made **in-house** and which should be **outsourced to contract manufacturers**?
- Has the company taken the appropriate steps to **collaborate and partner** with strategic contract manufacturers and suppliers?
- Have **innovation processes** been reshaped to better integrate R&D with manufacturing, and have opportunities been explored to extract synergies from each?
- Does the company have a clear understanding of the key cost drivers, their magnitude, and their contribution to **total landed cost**?
- Has the company determined **other low-cost-country sources**, prepared risk mitigation plans and created a transition plan?
- Has the company established the appropriate set of triggers to **reevaluate the mix of manufacturing strategies** (such as, regional, low-cost-country, responsiveness) and drive continuous improvement?

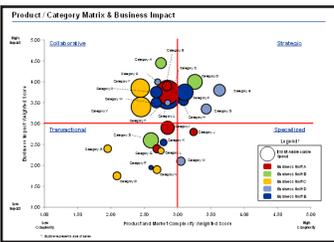
Sample Deliverable: Product Category vs. Business Impact



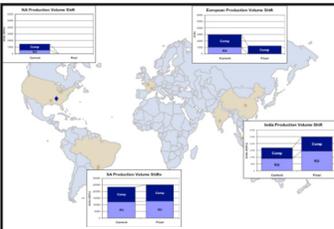
Sample Deliverable: Global Production Volume Dashboard



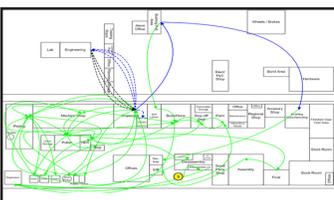
Sample Deliverable: Manufacturing Network Optimization



Sample Deliverable: Value Stream Analysis Map



Sample Deliverable: Supply Chain Benchmark Analysis



How companies address these questions

These questions, while challenging, have been asked many times before. To aid our clients in aligning and continuously improving their manufacturing networks, Archstone Consulting, a Hackett Group Company, has developed a set of solutions to help companies answer these questions. These solutions include:

Manufacturing and Sourcing

Benchmarking: Our benchmarking capabilities enable companies to gain an alternative perspective on the efficiency and effectiveness of their manufacturing operations. Archstone uses quantitative data to evaluate elements such as productivity, wage rates, overhead, and indirect costs. Combining this data with a qualitative assessment that provides insights into adoption of world-class practices and execution capabilities, we can help companies capitalize on strengths and reinforce areas of need.

Manufacturing Network Strategy:

Through a combination of network modeling and analysis of total landed cost, we help companies evaluate their current manufacturing footprint and develop new networks that can achieve a more optimal balance of costs, flexibility, capital investment, inventory and risk.

Contract Manufacturing Strategy and Development:

Contract manufacturing has grown at a much faster pace than manufacturing overall, yet it has not received the organizational attention it deserves. Archstone has developed an

analytical approach to drive insource-versus-outsource decisions. When outsourcing is an appropriate solution, we help companies determine the right type of relationship (strategic partner through tactical vendor), supported by the appropriate governance model to deliver ongoing performance improvements.

Manufacturing Plant Consolidation:

Many of the assets operating in today's environment were constructed to fulfill a very different type of demand profile. Whether driven by restructuring efforts, migration to low-cost-country sourcing, or postmerger integration efforts, determining which plants to improve, which to close, and which to grow is a critical need for our clients. Should this need arise, our team helps evaluate the existing network, conduct the analytics, and plan for an effective low-risk transition.

Manufacturing Flexibility and Productivity:

This solution helps companies streamline plant operations, improve effectiveness of productivity and operating assets, simplify flow and reduce indirect labor. Our teams utilize Lean and Six Sigma tools to help drive results within weeks, while extending the useful life of manufacturing assets.

The dynamic forces driving today's global supply chain decisions indicate that the structure and fit of manufacturing will continue to evolve. Having a view that balances excellence in execution today with a view of what the network and capabilities should be tomorrow will separate the winners from the rest of the pack. 📊

About the authors:



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Shawn McCormick is a director in Archstone Consulting's Supply Chain Practice. He has over 10 years of experience consulting to manufacturing clients in a variety of industries on issues ranging from network optimization to plant performance improvement. Shawn received an American Society for Quality Six Sigma Black Belt certification in 2009. Shawn has an undergraduate degree in physics and received his M.B.A. from the Marshall School of Business at the University of Southern California. Previous to joining Archstone, he was a principal with A.T. Kearney. Shawn began his career as a manufacturing engineer at Hughes Aircraft Company.



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Principal
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Cort Jacoby is a principal in Archstone's Supply Chain Practice. He has worked with a variety of consumer product manufacturers, retailers and manufacturers to assist in the development of supply chain strategies and help lead transformation efforts. Cort has over 20 years of experience in consulting and industry. Cort has delivered projects that span supply chain activities but has concentrated in manufacturing, supply chain planning and procurement. Cort graduated from University of Illinois in 1988 with a B.S. in chemical engineering and received his M.B.A. from Northwestern's Kellogg Graduate School of Business in 1994. Previous to joining Archstone, Cort was a partner with Deloitte Consulting and a manager with A.T. Kearney. Cort originally started out his career at Shell Chemical Company and also worked for i2Technologies. Cort is originally from the Chicago area and currently resides in Deerfield, Illinois, with his wife and two children.

- ¹ "Some manufacturing heads back to USA," *USA Today*, August 6, 2010.
- ² Robert Turner, "Still Made in America: The Myth of Waning U.S. Manufacturing Prowess," *Turner Investment Partners*, February 9, 2011.
- ³ *Mfg_POV_Data_Vignettes_041811_v[4]1.ppt*
- ⁴ "Some manufacturing heads back to USA," *USA Today*, August 6, 2010.
- ⁵ Brendan I. Koerner, "Made in America: Small Business Buck the Offshoring Trend" *Wired*, February 28, 2011.
- ⁶ Kris Maher and Bob Tita, "Caterpillar Joins 'Onshoring' Trend," *The Wall Street Journal*, March 11, 2011.
- ⁷ "Some manufacturing heads back to USA," *USA Today*, August 6, 2010.
- ⁸ "P&G Celebrates Grand Opening of First New U.S. Based Plant in 40 Years," *PRNewswire via COMTEX*, March 16, 2011.
- ⁹ "Some manufacturing heads back to USA," *USA Today*, August 6, 2010.
- ¹⁰ Nicholas P. Dewhurst and David G. Meeker, "Improved Product Design Practices Would Make U.S. Manufacturing More Cost Effective," *Boothroyd Dewhurst, Inc.*, 2004.
- ¹¹ *Ibid.*
- ¹² Erika Kinetz, "Honda, Toyota cut India production after tsunami," *Associated Press*, April 26, 2011.
- ¹³ Koji Sasahara, "Toyota car production plummets after tsunami," *USA Today*, April 25, 2011.
- ¹⁴ Martyn Williams, "Texas Instruments see 6 month disruption at Japan plant," *itnews.com*, March 30,
- ¹⁵ Daisuke Wakabayashi, "Earthquake Clouds Japanese Earnings Recovery," *The Wall Street Journal*, April 29, 2011.
- ¹⁶ Robert Turner, "Still Made in America: The Myth of Waning U.S. Manufacturing Prowess," *Turner Investment Partners*, February 9, 2011.
- ¹⁷ "Some manufacturing heads back to USA," *USA Today*, August 6, 2010.
- ¹⁸ *Intellectual Property – an Introduction*, U.S. Department of Justice, *Computer Crime and Intellectual Property Section*.
- ¹⁹ Brendan I. Koerner, "Made in America: Small Business Buck the Offshoring Trend," *Wired*, February 28, 2011

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About Archstone Consulting

Archstone Consulting, a division of The Hackett Group, Inc. (NASDAQ: HCKT), is a leading strategy and operations management consulting firm, specializing in the consumer products, retail, life sciences, and general manufacturing industries. Archstone Consulting helps companies restructure and reduce their costs, while improving their business processes and operations. The Hackett Group (NASDAQ: HCKT), a global strategic business advisory and operations improvement consulting firm, is a leader in best practice advisory, business benchmarking, and transformation consulting services including strategy and operations, working capital management, and globalization advice. The Hackett Group and its brands (Answerthink, Archstone Consulting, and REL) have completed over 5,000 benchmark studies and worked with 2,700 major corporations and government agencies, including 97% of the Dow Jones Industrials, 73% of the Fortune 100, 73% of the DAX 30, and 45% of the FTSE 100.