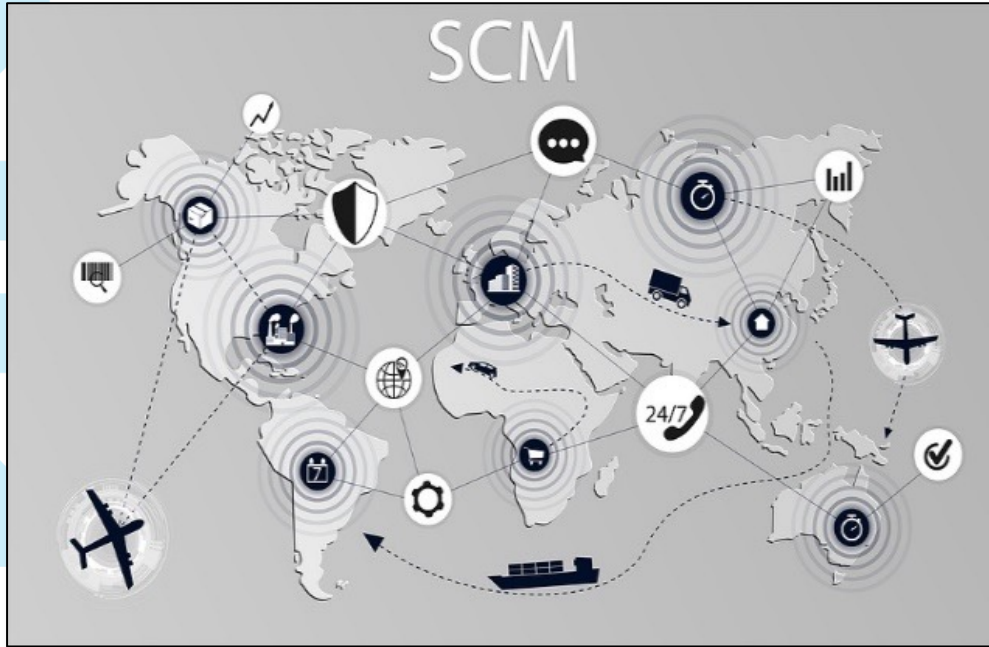


State of the Global Supply Chain

Supply Chains are on the Move

Lisa Anderson, President, LMA Consulting Group Inc

The Global Supply Chain: A System of Systems & Challenges



Challenges in the Supply Chain: Russia-Ukraine War



Take-Aways

- **Oil & natural gas:** Critical importance
- **Commodities:** Impacts food, fertilizer, and commodities such as aluminum, nickel, palladium and more used in medical equipment, airplanes, and much more.
- **What is changing?**
 - Due to the EU restrictions, Russia pivoted to selling oil and natural gas to India and China.
 - Countries are looking for new sources of supply. For example, U.S. exports to Europe in fertilizer have increased.

Challenges in the Supply Chain: China-Taiwan Tensions



Take-Aways

- **Advanced computer chips:** Taiwan produces 90% of the advanced computer chips in the world and 65% of all computer chips.
- **Military exercises:** China is performing military exercises around Taiwan which is causing tensions in the South China Seas.
- **Rare Earths:** According to Brookings, China produces 60% of the rare earths and processes 85% of the rare earths (needed for computer chips).

- **US CHIPS act** (\$52B): The U.S. is reversing its downward trend in capacity from 37% in 1990 to 12% today with investments in Texas (Samsung, TX Instruments, etc), Arizona (TSMC), Ohio (Intel), NY (Micron)
- **Europe CHIPS act** (\$47B). TSMC is expanding in Germany; Intel is investing in Poland.

Challenges in the Supply Chain: China High Alert Risk



Take-Aways

- **Manufacturing Footprint:** China is #1 in manufacturing and accounts for 28.7% of the world's manufacturing output.
- **Critical supplies are manufactured in China @ high global risk.** Active pharmaceutical ingredients (API), equipment required for electrical power grids, mining for rare earths, lithium for batteries, and more
- **Available Water Capacity 50% Below Acute Water Scarcity Level:** According to UN definition, China's Northern China Plain's per capita available water supply is 253 cubic meters vs UN definition of water scarcity (1000) absolute scarcity (500)
- **Water is Required for Electricity:** In China, they use 60% coal, 20% hydro, and 20% nuclear, solar and wind.
- **China's Zero COVID policy** proved that China can and will shut down plants & ports putting critical supplies at risk.
- **China wants to control the South China Seas,** creating complications for shipping lanes
- **Rare earths** More rare earths will be needed in the next 27 yrs than the last 3000, and China dominates rare earth mining and processing.

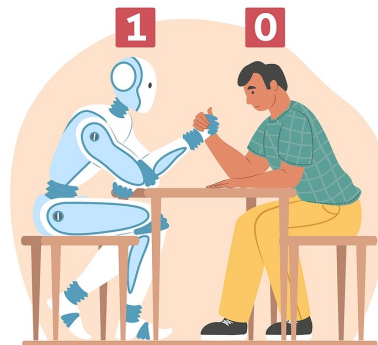
Challenges in the Supply Chain: The Panama Canal



Take-Aways

- **Panama Canal:** 40% market share for containers moving goods from Northeast Asia to the U.S. East Coast go through the Panama Canal
- **Drought conditions** are creating a new round of supply chain disruptions
 - Reduced the number of container ships by 20% (from 40 to 32).
 - Put restrictions on the maximum ship draft to 44 feet (vs. 50 feet)
 - Creating inflationary pressures, shortages and delays
- **Further risk** since Hutchison Ports controls both ends of the Panama Canal with a terminal at each end.
- **Mitigate risk:** Companies are searching for ways to mitigate risk – finding alternate routes, modes of transportation, moving manufacturing, forward positioning inventory, right-sizing inventory, and changing the distribution network.

Challenges in the Supply Chain: Talent & Technology



Talent

- **Workforce participation:** Participation has been lower than pre-pandemic and struggling as of late.
- **Scarcity of skilled labor:** The need continues to increase for skilled labor.
- **People vs. Robots (& Automation):** According to McKinsey, automation will account for 25% of industrial companies' capital spending over the next 5 years. And Gartner predicts that by 2026, 75% of large enterprises will have adopted some form of intralogistics smart robots

Technology

- **Cyber attacks:** Global attacks have been increasing greatly.
- **ERP & related technologies (AI, blockchain, e-commerce, IoT, etc.):** The digitization of the supply chain is coming quickly.
- **The critical importance of data:** Not only are companies overwhelmed with how to handle data, but the sharing of data is a hot topic as logistics is a system of systems.
- **Keeping up with regulations:** Technology is struggling to keep up with regulations.

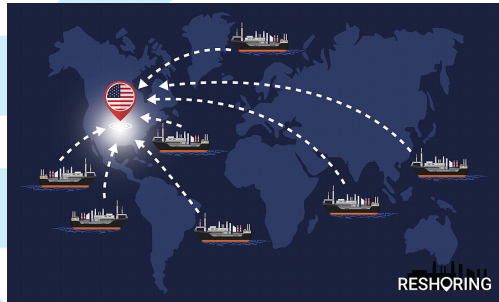
Challenges in the Supply Chain: The Economy



Take-Aways

- **Inflation:** No end in sight due to supply scarcity.
- **Recession:** On the other hand, there are strong recession indicators due to rising interest rates, global conflicts, lack of energy and more.
- **Pricing:** Pricing strategies to keep up with changing conditions

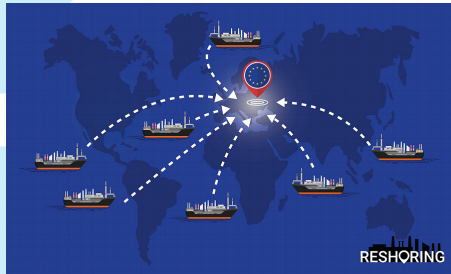
Path Forward to Success: U.S. Response to Supply Chain Risk



Take-Aways

- **Reshoring:** According to the Reshoring Initiative 2022 Data Report, IRA and Chips Act boost reshoring to another all-time high (360,000 jobs), up 53%. For example, Intel is reshoring to Ohio and expanding capacity in Arizona, Tesla is expanding its Texas Gigafactory and building a Texas lithium refinery, and chipmakers are building new sites.
- **Nearshoring to Mexico:** Mexico became the US top trading partner in 2023 (USMCA). For example, HP and Dell are moving production to Mexico and Mexico's economy ministry identified 198 announcements of foreign direct investments from the private sector, totaling more than US\$68bn, in the year through July.
- **Nearshoring to Latin America:** Although Mexico is the powerhouse, companies are also pursuing nearshoring. For example, textile and apparel manufacturing is moving. Target, Columbia Sportswear, and Hansaw Co. have made massive commitments to Latin American sourcing, (El Salvador, Guatemala, Honduras, Nicaragua).
- **Southeast Asia sources:** Thailand, Vietnam, and others are growing. For example, Nike is moving to Southeast Asia and Dell is moving to Vietnam.
- **India:** Seen as vast potential for expansion. For example, Apple is moving to India.
- **Mitigating risks with shipping routes & ensuring backups intact**

Path Forward to Success: EU Response to Supply Chain Risk



Take-Aways

- **Reshoring:** Europe is also seeing a pickup in reshoring. For example, the European CHIPS act is investing heavily in reshoring. Germany and France are attracting the most investment (chips, aerospace etc.).
- **Brexit:** Negatively impacted Britain (down 6%) although it remains 3rd in attracting investment. Supply chains are moving to the EU. For example, Ireland is booming with a 21% increase in FDI (seen as business friendly).
- **Nearshoring to Eastern & Southern Europe:** Investment was up substantially in Portugal (24%), Poland (23%), Italy (17%), and Romania (86%). This trend is likely to continue, just as it is in the U.S. as it provides a lower-cost option within the EU.
- **Sustainability reporting requirements** – likely to lead to additional tariffs for environmental impacts, encouraging supply chains to continue to be “on the move”.
- **Energy roadmap:** There is significant investment in renewable energy yet there is a realization that the Russia-Ukraine gap must be filled near-term.
- **Mitigating risks with shipping routes & ensuring backups intact**

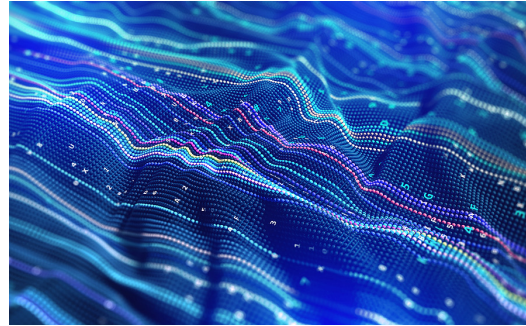
Path Forward to Success: Japan Response to Supply Chain Risk



Take-Aways

- **Reshoring:** The risks are simply too great with China and firms are ramping up production in Japan. At the start of the COVID-19 pandemic, Shinzo Abe created a US\$2bn assistance package to help Japanese manufacturers move their production back to Japan from overseas.
- **Expertise, automation & robotics:** Japan benefits from expertise and leadership in materials and manufacturing technologies as well as being in a strong position in industrial robotics and factory automation which is imperative to bringing manufacturing back in an automated, efficient, cost-competitive way.
- **Partnering:** In Japan, an agreement has been made with the USA to team up on emerging technologies, in areas such as AI, biotechnology and of course semiconductors. Additionally, Rapidus, a new Japanese government-backed company, has partnered with IBM, to develop the next-generation of semiconductors.
- **Nearshoring:** There is risk with the South China Seas, and so companies are taking these risks into consideration; however, Japan is investing heavily into India. For example, Sony, Panasonic and Toyota are just three of the popular Japanese manufacturers in India.

Path Forward to Success: Take Control of Your Talent & Technology



Talent & Technology Go Hand-in-Hand

- **Secure your talent:** You are only as strong as your weakest link in your supply chain. Focus on supply chain partners.
- **Innovation is key to success:** advanced manufacturing, 3D printing, and innovation will be critical to success
- **Invest in Technology** to compliment and engage your teams and to automate and digitize your supply chain.
- **Sharing of data:** Focus on your partners and think about your end-to-end supply chain performance.
- **Training & Development:** Accompany training & development with technologies.

Path Forward to Success: Take Control of Customer Success



Take-Aways

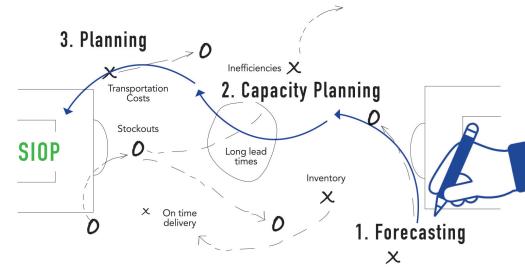
- **Listen to your customers:** Pay attention to what is important & design with customers in mind.
- **Collaborating with supply chain partners:** Design in collaboration with win-win strategies.
- **Right-size inventory:** to achieve customer success (OTIF, lead times)
- **Supply chain visibility:** provide Amazon-like visibility to your supply chain
- **Supply chain resiliency** - Bring manufacturing closer to customers and ensure backups exist.
- **Supply chain risk** – continually assess risk and adjust as needed.

Path Forward to Success: Your Playbook for Business Success: SIOP/S&OP



To receive a complimentary copy of, “SIOP (Sales Inventory Operations Planning): Creating Predictive Revenue & EBITDA Growth”

<https://www.lma-consultinggroup.com/siop-book>



SIOP provides the playbook for business planning and execution.

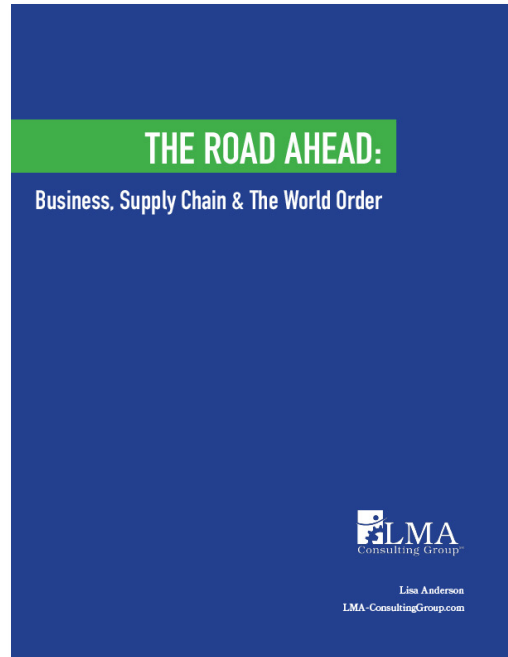
Take-Aways

- **Get in front of customer demand (create predictability):** Know more about your customers’ demand than they do.
- **Prioritize demand:** Customer and product profitability; fit with strategic direction
- **Ensure you are prepared to supply your customers’ needs:** focus on customer success
- **Adjust your manufacturing & supply chain as needed:** Insource, outsource, find new partners, expand capacity, position inventory, and do whatever is required to adjust your supply chain to provide a superior customer experience while minimizing risk and cost.
- **Maximize EBITDA & working capital:** Plan ahead, address bottlenecks, surface critical strategic decisions, and execute flawlessly.
- **S&OE:** Execution must be tied with SIOP to succeed

Challenge or Opportunity?



Special Report for More Details

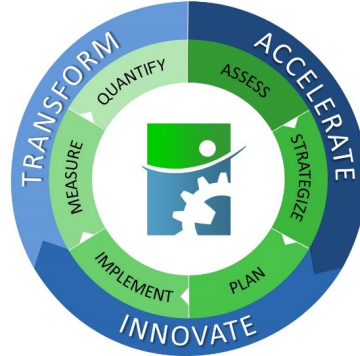


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LMA Performance Advantage



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