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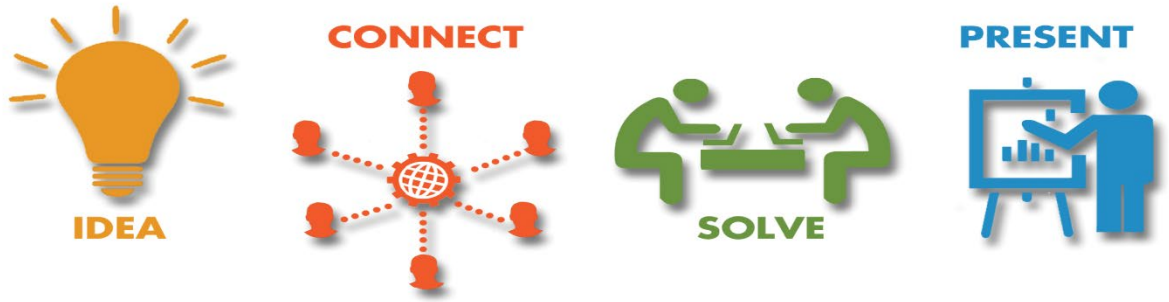


A COVID-19 Virtual Ideation Experience

**Team Topic and Number: Manufacturing & Industrial Team 4**

**Team sponsor/chapter (if applicable): SIOR**

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Manufacturing and Industrial organizations continually evaluate their supply chain for cost savings and risk reduction. As market shifts occur the evaluation process becomes even more focused. The COVID-19 pandemic has ramped up the evaluation process to levels likely not seen in the past. All

manufacturing and industrial organizations have been impacted in a variety of manners which have been dependent upon the product they manufacture, company size, labor requirements and location of operations.

It would make sense to believe that the primary supply chain related focus for COVID-19 is to reduce the risk caused by COVID-19 contamination. However, the reality is not that simple. Vendors and contract providers of raw materials are the lifeline of manufacturing organizations and ensuring that the vendors are able to remain financially solvent is of utmost importance. When a vendor shuts down operations, organization are then required to find replacement firms, or they must take control of the processes themselves. The current combination of COVID-19 and the extreme volatility in oil prices is crushing the supply chain for the oil and gas industry. Recent reports highlight expectations that 60-70% of oil and gas industry vendors could go out of business over the next year. As a result, primary groups within the oil and gas industry supply chain must now fully evaluate all options including considering mergers and acquisitions to ensure seamless management of the processes moving forward. In order to preserve their own sustainability, these groups must now seriously consider spending significant capital to purchase a vendor instead of preserving cash which is what has historically been done in times of crisis.

Companies will continue to manage their supply chain with reduced risk and increased efficiency. Does the increased efficiency include the consideration of new emerging markets with less risk? Yes and No. There are risks in every market, regardless of COVID-19's presence. Some countries have done a better job with their pandemic readiness and in turn those countries will be looked at a bit more positively than in prior years. Coincidently, the fact that some of the Asian countries have responded well to the COVID-19 crisis has solidified one firm's decision to expand operations in South Korea and Malaysia. At the same time, as reported by Katy Huberty, head of equity research for North American Technology Hardware at Morgan Stanley, "Technology vendors are encouraged by the pace at which China's production has ramped up post the COVID-19 shock, and this has reinforced their belief in locating the production of their high-volume products in China. This provides reassurance that China will remain a large base for manufacturing in these products." Of course, the fact that China is doing well with technology products does not mean that they are equally as strong with all other product categories including pharmaceuticals and medical supplies. US based companies need to consider more than economics when ascertaining the risks with items such as antibiotics of which 90%+/- are manufactured in China. Is a reduced profit margin an acceptable consequence to ensure that the world has a steady, consistent supply of antibiotics? The U.S. Government could weigh in and require that a larger component of their pharmaceutical supply chain be maintained in the U.S. in order to decrease dependency on China and India.[1]

However, there are still many other variables that will still need to be considered prior to adjusting supply chains. On Thursday April 30th in a session with SIOR Global, Andrew Busch (the first Chief Market Intelligence Officer for the US Government) stated that "Supply chains have to be re-thought. Can they get back to NAFTA from China? Can this be through redundancy (i.e. multiple plants) even though this won't be good for earnings?" There likely will not be consistency in responses to these questions. In fact, Katy Huberty also stated "while there will be some diversification in the supply chain to economies like India, Vietnam, Mexico and Taiwan, companies are currently focused on cash preservation and costs, which will limit the scope of such diversification moves in the near term." Furthermore, there are concerns with Mexico regarding their unsettled political environment. This concern potentially could offset the benefits associated with Mexico including geography and the fact

[1] Fox News, March 17, 2020 "US pharmaceutical industry aims to wrest some drug production back from China"

that the majority of all large US manufacturers already have a presence in Mexico. Canada on the other hand has a more stable political environment but overall the labor costs are relatively high in Canada in comparison to many other countries. US companies will need to decide if these concerns are low enough to risk relocating portions of their supply chain from China to NAFTA countries.

What we do not know is how the regulatory environment is going to adjust and what consumer preferences will be as a result of the pandemic. Tax changes will certainly impact decisions moving forward and are believed to be a potential result of the COVID-19 crisis. U.S. President Donald Trump is now seeking from Congress a new round of tax cuts. Larry Kudlow, the president's chief economic adviser, has stated that "the economic team is studying long-term growth incentives at Trump's direction. They include a 100 percent tax deduction for businesses on meals, entertainment and sports events and an extension of a provision that would allow businesses to immediately deduct the full cost of their investments." The ability to allow businesses to immediately deduct the full cost of their investments could have an immediate impact of US based manufacturers and their decision to onshore some or all of their supply chain. The details of this potential tax incentive will need to be fully reviewed and explored prior to any major supply chain decisions being made.

As a nation, we outsource a large amount of production. Will the government allow this to continue with pharmaceuticals and other medical products? The consensus is the government will adjust this, it is a matter of how extreme the requirements will be, and how much the windfall will impact other industries. Consumer and shareholder preferences will have similar impacts once they are understood. Regardless, the competition for the United States will always remain steep as other countries continue to develop similar and/or better incentives to take advantage of the potential opportunities. One major change that will likely occur is the research into and ultimate implementation of automation and robotics. Concerns associated with job losses due to automation will potentially be offset with increased levels of jobs in these higher tech industries. According to a 2018 study by the World Economic Forum, "One set of estimates indicates that 75 million jobs may be displaced by a shift in the division of labor between humans and machines, while 133 million new roles may emerge that are more adapted to the new division of labor between humans, machines and algorithms." Investment into automation will ultimately enhance organization's existing technologies to avoid the continual unknowns that are constantly requiring these many, multi-layered risks. The advantage of investment in robotics should be focused on the geographical area(s) where the greatest cost savings can be effectuated versus placing new installations in low-labor cost arenas, whereby the least beneficial benefits and justification can be realized, especially in times of a pandemic. Investment credits to effectuate such investments should be appropriately accomplished where higher cost areas of the supply chain prevail within the United States.

As organizations continue to evaluate overall risk during the pandemic, the supply chain concerns have been foremost in the thoughts of C suite executives across the globe. As recently stated by the CEO of a publicly traded aerospace company, "We've been closely monitoring our supply chain, which is predominately U.S.-based. In Q3 (ending March 31, 2020) we made some forward inventory buys and pre-ordered materials to mitigate risk. Thankfully, the pandemic's impact on our supply chain and suppliers thus far has been somewhat insignificant." This same CEO also is seeing three main trends – supply chain delayering by the government and the primes, the primes' flight to quality suppliers, and the increased outsourcing by our customers at the subsystem level.

Overall, COVID-19 has been a wake-up call to many organizations related to their supply chain, while to others it has only highlighted how well their supply chains have been organized. Each and every organization needs to first and foremost decide on an acceptable level of risk. The risk level will vary greatly to each and every organization, but overall it is apparent that economics of manufacturing overseas will be evaluated by more than the ultimate cost of the product. The risk of government response to pandemics, the infrastructure of shipping and transportation, and the sustainable health and well-being of the work force must be evaluated as well as the production of cost.