January 2018 Research Advisory Report

2018 Annual Predictions for Industry and Global Supply Chains

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Introduction and Purpose

Once a year, the *Ferrari Consulting and Research Group* provides a series of predictions for the coming year. These predictions are provided in the spirit of helping multi-industry teams in setting management agenda for the year ahead and helping our clients and readers to prepare their supply chain management teams in establishing meaningful programs, initiatives and educational agendas in the coming year.

Our process includes a re-look at all that occurred in the current year, a reflection of future implications, and soliciting input from clients and other supply chain and industry observers.

The context for these predictions includes a broad cross-functional umbrella of supply chain strategy, planning, execution, product lifecycle management, procurement, manufacturing, transportation, logistics and service management business processes.

We incorporate a lot of thought into our predictions and scorecard our annual predictions at the end of each year. Score carding of prior annual predictions can be viewed on the *Supply Chain Matters* blog starting in mid-November 2018.

We plan to monitor and provide added insights regarding all of our predictions in the coming year through augmented research reports and continuous updates on the *Supply Chain Matters blog.*

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2018 Predictions in Detail

2018 Prediction One: A Buoyant Global Economic Outlook Comes with Important Signs of Caution

On the surface, the global economy is now growing at its fastest pace in over six years and most global economists predict that the momentum will continue in 2018. A review of key global supply chain related indices contrasting the end of 2016 with that of the end of 2017 reflect the following snapshot:

Key Global Supply Chain Indices	End of 2016	End of 2017	Change
Equities			
S&P 500 Index	2239	2674	19.43%
Dow Jones Industrial Average- DJIA	19763	24719	25.08%
Interest Rate			
U.S. Prime Rate	3.75%	4.50%	20.00%
Currency Markets			
Wall Street Journal U.S. Dollar Index	$92.94	$85.98	-7.49%
Value of Euro to U.S. Dollar	$1.05	$1.20	14.29%
Value of China Yuan to U.S. Dollar	$6.94	$6.50	-6.34%
Key Commodity and Energy Markets			
Dow Jones Commodity Index-TR	273.80	282.34	3.12%
S&P GSCI Index	2417.3	2556.7	5.77%
USD Price of Brent Crude (per BBL)	$56.75	$66.63	17.41%
U.S. Avg. Retail Price Diesel (per gal.)	$2.51	$2.91	15.94%
U.S. Avg. Retail Price Gasoline (per gal.)	$2.25	$2.59	15.11%
Global Supply Chain Activity			
J.P. Morgan Global Manufacturing PMI	52.7	54.5	3.42%

The International Monetary Fund's (*IMF*) *World Economic Outlook* published in October observes that the global economic picture is now very different than just 18 months ago, with accelerating growth occurring in Europe, Japan, China, and the United States. The *IMF* is therefore forecasting that overall global growth is projected at 3.6 percent in 2017 and 3.7 percent in 2018. Further noted is that while short-term risks are broadly balanced, medium-term are still tilted toward the downside.

Likewise, the ***Organization for Economic Cooperation and Development*** (*OECD)* observes in *its November 2017 Economic Outlook* that global growth has picked-up and synchronized globally but also cautions to longer-term challenges. The *OECD* forecasts *Real GDP* growth to be 3.6 percent in 2017, rising to 3.7 percent in 2018.

The global growth momentum trend is also reflected in current global supply chain management activity indices. The *J.P Morgan Manufacturing* PMI reading at the end of 2017 accelerated to a near seven-year high, signaling expansion in each of the past 22 months. The index of broad global supply activity rose 3.42 percent in all of 2017. Business was reported as improved across the board in consumer, intermediate and investment goods sectors.

One concern area among global economists is a growing consensus to a possible downside risk in China's economy given current high levels of debt burden. Some continue to observe that China's economic policies are walking a tightrope. Any subsequent sneeze or hiccup is likely to be felt by multiple industry supply chains.

One of the more significant unknows for managing expected revenue output and profitability goals in 2018 will center on trade developments, with the two most obvious being the planning related to *Brexit* and the reality of a new *NAFTA 2.0*, or a dissolving of the existing trade pact. We will address this specifically in a follow-on prediction.

Global industry and supply chain teams need to orient their 2018 plans and resources toward managing healthy output levels, but at the same time be prepared to manage the most important cautionary signposts:

- Manufacturing and supply chain employment levels have reached all-time highs among developed and some developing regions, with the result being a continuance of the supply chain talent perfect storm, namely demand for skilled talent far exceeding available supply. Our guidance for 2018 is re-doubling efforts on employee retention, increased skills development of existing employees and coming to grips with the realities of needs for higher compensation for the most in-demand skills. In terms of organizational and technology investment priorities, 2018 should be a year of high concentration and investment in needed productivity improvements at individual and team levels.

- Strong global demand continues to test production capacity levels, especially among developed regions. Heightened global supply chain activity coupled with foreign currency market dynamics has led to increased price inflation for inbound materials which is likely to continue. They each remain a clear sign that lead times for products will continue to be extended by various domestic and global suppliers with higher costs for direct materials. Now, more than ever, there is a need for agility and more informed response in overall planning processes.

- Insure that master data related to planning, costs accounting and material requirements planning systems are updated on a more frequent interval to reflect actual conditions.

- Sourcing and procurement teams need to focus on supplier intelligence, supply risk assessment and nurturing added product innovation among the supply base.

2018 Prediction Two: An Optimistic Yet Challenging Year for Industry Supply Management Teams

Multi-industry procurement and supply management teams approach 2018 with positive optimism regarding business growth, but similar to 2017, we are once again predicting another challenging year for managing direct materials costs. The year will present compounding carryover challenges from 2017, and added ones for the coming year. While inbound commodity prices are forecasted to have modest increases, accelerating global demand for products can lead to individual shortages or supply-demand price pressures. From a supply management leadership perspective, teams will again be tasked with organizational transformation needs out of necessity, as is stepping-up efforts in mitigating and managing added supply risk.

Supply Streams

The World Bank Commodity Markets Outlook published in October 2017 called for general increases in global commodity prices as overall demand continues to strengthen.

Energy prices are expected to rise by 4 percent in 2018, with crude oil prices to average $56 per barrel as compared to a 2017 average of $53 per barrel. This was described as a marginal upward revision from the April 2017 forecast. The report cautions that there are, once again, substantial risks in the forecast due to supply sources from politically-stressed regions. Natural gas prices are forecasted to increase 3 percent globally, and 4 percent in the U.S. based on continued strong demand.

After rising an average of 26 percent in five of the last six quarters, **Metals and Minerals** prices are projected to ease slightly in 2018. Upside risks center on more robust global demand or unexpected supply shortages. One clear sign of industry-specific commodity shortage was that of electrically powered automobiles and trucks. In late 2017, investors and speculators had doubled the price of *lithium* and *cobalt*, as were prices of *manganese, vanadium* and *molybdenum*. Manufacturing across China remains the major global influencer of metals and minerals prices. **Raw Materials** prices were forecasted to move up more than 2 percent this year, and tick up even more in 2018 due to some tight supplies.

Agricultural prices are forecasted to stabilize in 2018 after receding modestly in 2017.

Internal Industry Supply Management Outlook

The December 2017 release of the ***Institute for Supply Management (ISM) Semiannual Economic Forecast***, reflecting the outlook perspective from actual U.S. based sourcing and procurement professionals, indicates optimism for the coming year.

Manufacturing focused revenues are expected to increase by 5.7 percent, a one percentage point increase over prior 2017 predictions. The 12-month outlook for manufacturing, known as the ***Diffusion Index***, rose from 67.5 to 81.5 in December of 2017, a sign of additional optimism.

Prices paid for raw materials were forecasted to increase 1.3 percent during the first four months of 2018 with the anticipation of a further 0.5 percent increase for the balance of the year. The *ISM* panel expects the *U.S. Dollar* to incur additional gains against the major currencies of trading partners, similar to what occurred in 2017.

Broadening Business Advisor and Strategic Skills

Once again, we are compelled to add this category as an important capability for materials strategic sourcing and procurement teams for the coming year. As teams continue to transition from the role of seamless transactional *P2P* execution, to strategic advisor in area of supply management, three critical capabilities will be required to insure business value and effectiveness.

The first is a growing frustration among many industry observers with the need to simultaneously spearhead necessary ongoing supply chain cost reductions when all the low-hanging fruit has been harvested, while nurturing existing and new suppliers into new areas of process efficiency and product innovation. This requires higher levels of analytics based capabilities that can uncover added cost avoidance opportunities, particularly in the direct materials arena with the ability to foster a more collaborative, trust-laden supplier management environment. It requires a more detailed knowledge of existing and planned future products, and a much closer business advisor relationship with product design and management teams. As we pointed out in our 2017 predictions, increased business advisor, analytical analysis and change management skills have a high dependence on the experience levels of existing staff. B*aby boomer* supply chain leaders must address the realities of recruiting and developing *Generation X* and *Millennial* professionals for the tech-savvy, analytical and inter-personal team management skills that they can provide, while insuring attractive career pathways. That will become ever more challenging with labor markets reaching full employment levels in 2018.

The second is one with which many industry professionals also continue to struggle, namely the ability to demonstrate business value in the language of required business outcomes. What this translates to is higher levels of analytics based capabilities that can directly map cost savings to key financial metrics such as product margin, gross margin and line-of-business added revenue and profitability. The problem is often articulated as a lack of meaningful and accurate data, consistent metrics within and across existing application systems. When teams investigate today's new analytics-based technology capabilities, they become frustrated with organizational readiness to embrace such technology. Hence the first challenge noted above.

The third challenge will be proactive early-warning and action planning relative to pending or potential supply management problem areas related to changes in global trade agreements. As noted in *Prediction One*, 2018 will likely include the threat of changing global trade practices involving *Brexit* or *NAFTA* agreements or the possibility of a regional trade war with China brought about the current *Trump Administration*'s hard-nose strategy regarding specific product trade sanctions with China. A U.S. strategy for bi-lateral vs. multi-lateral trade agreements adds to the complexity of analyzing total landed-cost for particular products.

We advise senior supply management executives not to take a complacent view of existing direct materials strategic sourcing, but rather to support continuous what-if and scenario based planning methods. Engaging external management consulting firms on a continuous basis will likely be very expensive and will necessitate a hard look at developing such capabilities, internally leveraging today's more advanced technology to support such planning capabilities.

External Support Resources

Professional organizations such as *ISM* and *APICS* are continually assessing required job mastery skills from employers and incorporating such requirements in ongoing individual skills certification programs. In the case of *ISM*, the *Certified Professional in Supply Management (CPSM)* certification will incorporate new preparation and testing skill components in 2018. They will include the addition of competency areas related to *International Supply Management*, *Mitigation of Risks*, *Sales and Operations Planning (S&OP)* and *Technology*.

2018 Prediction Three: The Supply Chain Talent Perfect Storm Intensifies

At the beginning of 2017, for all the functions that make-up the umbrella of supply chain management capabilities, we predicted a supply chain perfect storm, one that would occupy a lot of management attention. The perfect storm is increased demand for specialized skills meeting limited available talent supply.

As we began assessing our *2017 Predictions*, we interviewed a select grouping of highly experienced supply chain management specialist recruiters to get a first-hand sense of recruiting and talent trends. To a person all our interviews confirmed that this perfect storm played out, and indeed reflected a candidate's market. Described was a great but challenging year in supply chain related recruitment, with talent in short supply, especially skill areas in the most demand.

We predict that in 2018, the supply chain talent perfect storm will intensify even more as the dimensions become more challenging from an overall demand perspective. Feedback from recruiters is that employers will continue tapping retiring, highly experienced professionals for temporary and part-time positions related to organizational needs.

The current level of robust global supply chain activity and that many developed regions have reached full employment levels adds to the 2018 challenge. Rodney Apple, Managing Partner at SCM Talent Group observed that there remains too much emphasis on "post and pray" and that supply chain employers need to think like marketing professionals, emphasizing branding, compelling content and benefit to recruitment activities.

As Bronwen Hann, *President and Senior Partner* at Argentus Supply Chain Recruiting indicated: "*Every company should be thinking about the bigger picture*." Employers will need to address the realities of re-doubling recruitment efforts that focus on broader needs in work-life balance, overall benefits as well as market competitive compensation levels. Jason Breault, Managing Director, LifeWork Search observed that candidate salary demands tend to go-down if work-life balance needs can be a part of the recruitment discussions.

An "always-on" supply chain and increased global supply chain process and management complexity have taken a noticeable toll on work-life balance. Millennials, the emerging leaders of industry supply chains highly value work/life flexibility as well as opportunities to broaden career growth. Businesses and supply chain leaders will have to wrestle with such realities.

Other feedback from recruiters is that employers will need to continue tapping retiring, highly experienced professionals for temporary and part-time positions related to organizational needs to bridge the current gaps in seeking new talent. Likewise, continued joint collaboration with supply chain management professional, academic, federal, and local community training organizations to tailor both on-the-job and new candidate skill building programs to specific employer needs are ongoing essentials.

Other skills in high demand will continue to be analytical and data management in nature, as will in-depth experience in leading and supporting business and supply chain digital transformation and expanded online omni-channel product offerings. Manufacturing recruitment will continue to be complex with processes becoming more advanced technology intensive as will online focused logistics fulfillment. In the case of the latter, retail employers continue to seek out experienced candidates with **Amazon**, **Ebay** or **Walmart e**xperience but non-compete clauses will continue to be more contentious.

We anticipate that growing smaller and medium sized businesses will be especially challenged in 2018 in their recruiting of experienced supply chain savvy professionals that also possess broad operational general management leadership skills. The realities of larger firms willing to compete on compensation and benefits will challenge such efforts.

Feedback indicates that some employers have been willing to compensate for in-demand technology skills such as data science and more predictive analytics, but the tradeoff has been that such skills must be shared across broader line-of-business and functional areas. The implication is a shared resource for supply chain management needs but that may be better than no resource.

As noted in *Prediction One*, our guidance for 2018 is re-doubling efforts on employee retention, increased skills development of existing employees and coming to grips with the realities of needs for higher compensation for the most in-demand skills.

In terms of organizational and technology investment priorities, 2018 should be a year of high concentration and investment in needed productivity improvements at individual and team levels.

Thus, as industry supply chain teams solidify business and operational planning in 2018, factor the reality that needed skills and talent will remain an ongoing challenge and will require far more collaboration and creativity on the part of many employers. This is a challenge that can no longer be thrown over the wall or solely delegated to the HR team. It will require top management oversight and leadership.

2018 Prediction Four: Cyber Risk and Information Security Safeguarding Needs Consume Supply Chain Risk and Advanced Technology Investment Considerations

With every passing month, the increasing frequency and sophistication of cyberattacks, some by state-sponsored players, threaten to do harm to major brands, services providers and their customers. Many specialists in the field of cyber security are predicting that 2018 will present even more challenges for data and information breaches, and some have raised alarms that the next potential threat will reflect control of devices within physical manufacturing, utility or transport networks.

We in turn, are predicting that cyber-related risk and information security safeguarding will consume business, IT, and industry supply chain teams, not so much by choice, but from compelling needs dictated by stockholders, boards and *C-Suite* executives. Brand and reputational risk is now a significant top-of-mind concern for businesses and budgets will likely reflect supporting mitigation efforts as a top priority. Such concerns will strain budgets and available resources and will especially consume the time and attention of procurement and supply management teams.

Background

One of the largest retail data breaches in history occurred in 2013 when personal credit card information concerning upwards of 40 million **Target Stores** shoppers was stolen by hackers. The hackers gained initial entry from a refrigeration repair services supplier's login credentials which granted open access to Target's business systems where the hackers were able to eventually find customer credit card data. Target incurred a reported $60 million in expenses directly related to the retailer's response to the credit card information breach and it cost the jobs and reputations of the brand, its *CIO* and its *CEO*, the latter two being forced to resign.

Looming Threats

In late 2017, in what was described as a watershed cyber-attack, suspected state-sponsored hackers targeted ***Triconex*** industrial safety technology provided by Schneider Electric. The incident which was confirmed by Schneider and prompted a security alert to customers, is an application used in energy generation facilities including nuclear and oil and gas-powered plants. Sources with knowledge of the attack, prudently declined to identify the source or location of the attack, and published speculation indicates a possible *Middle East* based target. According to a published Reuters report, the incident marked the first report of a safety system breach at an industrial plant.

In late 2017, news surfaced that a skilled Vietnamese hacker, reportedly utilizing the credentials of a third-party contractor, penetrated the operational systems of the agency supporting *Australia's Perth International Airport* and stole what is described as a "*significant amount*" of sensitive security information including building plans. This incident occurred in 2016 and report surfaced after the hacker was arrested and tried by a Vietnamese military court. While systems directly involved in supporting flight operations were not reportedly involved, the airport has since invested $2 million (AUD) in additional security measures. The reported Australian incident surfaced after London's *Heathrow Airport* officials launched a reported urgent investigation after an unprotected USB memory stick containing security information regarding that airport's security measures to protect the Queen were found on a London street.

Such incidents are in the shadow of the massive information breach that occurred at Equifax exposing sensitive personal information of untold millions and the *U.S. Federal Government's Office of Personnel Management* data breach compromising information on federal employee's security clearance files. Both incidents provided more sobering reminders of increased cyber security threats.

More closely related to global supply chain management, in late June 2017, a sophisticated ransomware attack that gained entry from a legacy payroll application spread from Europe across multiple countries. The result was a multi-day interruption in operational services of some European based logistics and transport firms as well as the globe's leading ocean container line. In the latter case, A.P. Moeller Maersk discovered that the attack spread across many of its linked operational systems, including its business subsidiary, APM Terminals, disrupting a reported 17 individual port operations including those of Rotterdam, New York-New Jersey, Los-Angeles-Oakland, and Mumbai. The virus spread so quickly that the company's IT teams were forced to immediately shutdown all systems.

In late November 2017, the ***Information Security Forum (ISF)***, a global, independent information security body that focuses on cyber security predicted an increase in the number and impact of data breaches. Steve Durbin, Managing Director of *ISF* indicated to business media that attacks in 2018 will be far more expensive for organizations of all sizes.

"*In 2018, we will see increased sophistication in the threat landscape with the threats being personalized to their target's weak spots or metamorphosing to take account of defenses that have already been put in place. These days, the stakes are even higher than ever before*."

The *ISF* outlined five global security threats, two which were described as the following:

- ***"The supply chain will remain the weakest link in risk management."*** The *ISF* indicates that as information continues to be electronically shared up and down and across the global supply chain, organizations will need to focus on the weakest links in information security.

- *The Internet of Things (IoT) will further add unmanaged risks.* With the expected increased interest in *IoT* enablement of enterprise business and supply chain decision-making processes, there is a reality that such devices are sometimes not secure by design. The *ISF* observes that when data breaches occur, organizations are likely to be held liable by customers and government regulators. In worst-case scenario situations, *IoT* devices embedded in industrial or product control systems could lead to physical harm and death.

Further observed is that misalignment between corporate boards and the *C-Suite* regarding the realities of a fully secure organization as an unattainable goal despite substantial investments implies that if and when a major incident occurs, it is likely to affect the reputation of the brand, board members and senior management.

All of the above compels us to add this cyber risk and information security safeguarding prediction due to its implications to the entire business.

Actions to Consider

If industry supply chain management teams have not done so, it is an imperative that they actively collaborate with internal IT systems and business continuity teams to scope, understand and take actions related to the most vulnerable systems related risks and to identify various scenarios for responding to and mitigating a cyberattack or system vulnerability.

A reality of many legacy operational systems is that of age, in some cases, systems and applications have existed for over ten to fifteen years. That implies many vulnerabilities-operating systems that long-ago, stopped being supported by automatic system updates and patches. Further, as we all know, lots of change and customization can occur in such time periods, making it rather challenging to debug or trace a virus attack. Global hackers are well aware of the vulnerabilities of such on-the-ground systems, some with login credentials that have never been updated. The adage that: "*if it ain't broke, don't mess with it*" no longer has credence and can be putting the entire business at-risk.

Firms most able to effectively respond to a cyberattack, or for that matter, any major business disruption, are those that have well-defined, multi-functional and multi-line-of-business continuity responsibilities and action plans. Cyber security is not the sole responsibility of corporate security and IT teams, instead it involves broader involvement and accountability. A business continuity plan that has too much dependence on corporate hierarchy decision-making can at-times risk the ability to have a timely response. The good news is that many businesses that have developed effective business continuity plans have been willing to share important watch-outs and learning.

Partner with business continuity, internal and external supply chain teams to offer timely training and/or webinars on responding to cyberattacks as well as information security and awareness. Encourage questioning and inquisitiveness as to prior history of cyberattacks, which systems seem to be the most involved, what to look out for in unusual or suspicious activity, and who to call if something indeed looks suspicious.

Rather than a response of: "*I'm too busy*", encourage a climate where information security is everyone's concern. It is better to make aware than to ignore. Insure that that system logins are changed on a regular basis to make it more difficult for hackers to penetrate systems. Likewise, collaborate with IT support teams to insure that application and systems patches are always up-to-date, even if that implies some brief downtime.

2018 Prediction Five: A Shifting in Priorities for Supply Chain Digital Transformation, Data Management and Technology Enhanced Business Relationships.

With accelerated adoption of the online buying economy, many industry supply chain organizations have acknowledged needs to transform processes toward what is often termed as digital transformation. The challenge up to now has been readiness, resources, and timing.

We predict that in the coming year, digital timetables will accelerate because of more compelling business forces accelerating such changes. One relates to the current speed and scope of multi-industry disruption. The second relates to comprehensive United States corporate tax reform measures that could either accelerate or re-focus process or technology areas of supply chain transformation.

We predict that this acceleration in digital transformation will continue to take on two dimensions in the coming year. One will be customer-facing, namely all digital processes supporting multi-channel customer fulfillment and services needs. The other will be supplier-facing, the digital linking of many supply network processes among existing *B2B Business* or *Industry network* processes. In some cases, leading edge innovative supply chains will begin to consider added interlinking of both to bolster network response to changing customer needs, support new digitally-enhanced business models or improve end-to-end network resiliency and response.

As we publish this prediction in early January, the *U.S. Congress* has passed comprehensive corporate tax reform legislation. Among the tenets of the final legislation are more attractive tax rates for businesses' ability to be able to return foreign cash reserves to the U.S.. Other provisions allow corporations to deduct the full cost of capital equipment investments from taxes in the year of purchase.

Depending on how individual firms begin to modify overall tax and financial planning will determine the acceleration of the transformation noted in this prediction. If companies are inclined towards favoring added capital equipment purchases, we foresee manufacturing, customer logistics and fulfillment automation as the likely recipients including more autonomous material handling, robotics-enabled manufacturing assembly and movement equipment investments.

In terms of implications to size of business, we predict that these shifting priorities will have a broader positive impact on small and mid-sized businesses because that will likely not have the legacy of older legacy processes and supporting systems along with the ability to move toward digital transformation with fresh thinking and a quicker pace.

Industry and Supply Chain Network Clouds Accelerate in Adoption

The needed acceleration of digital transformation adds to the attractiveness of public or private *Cloud* based platforms and supporting IT infrastructures. Supply chain and line-of-business transformation teams know full well that attempting to rip and replace existing legacy applications and technology is far too disruptive and expensive. With global supply chain activities reaching historic highs, now is not the time for businesses to risk a systems related disruption.

Industry and Supply Chain *Clouds* afford ubiquitous connectivity and data exchange among customers and suppliers and allow the cost burden to be amortized over multiple time windows. *Cloud* platform providers have the ability to leverage overall network participation while investing in the latest advanced technology and data security tools and processes. In industry environments that remain highly sensitive to reducing costs and accelerating process efficiencies, the ability of industry supply chain and IT teams to recommend *Cloud* adoption strategies will further resonate in 2018.

2018 will likely feature additional *M&A* activities among large enterprise, industry-specific *a*nd specialty best-of-breed *Cloud* technology providers. The strategy among *such* technology providers in 2018 will be about building scale and market influence.

We further anticipate one or two high profile *Cloud* technology providers to stumble in 2018 because of a flawed business model or a market misstep. Customers have become much more savvy to being locked into proprietary and overly expensive platforms and that will likely lead to such a stumble.

Pause in ***Internet of Things (IoT)*** **Investment**

Our sense is that *IoT* investments will encounter some setbacks in 2018 for two specific concerns.

The first, as noted in *Prediction Four*, will be increased emphasis on cyber security in the coming months, and specifically for addressing ongoing perceptions that current *IoT* platforms are not addressing concerns for data security or vulnerability. Technology providers will have to prioritize ongoing development, deployment and product marketing efforts toward higher levels of protecting *IoT* operational data and not allowing *IoT* portals to be the conduit of cyberattacks or to compromising the safe operation of physical equipment. *IoT* platforms will therefore have to demonstrate to prospective business customers their ability to pass rigorous data security audits and standards.

The second is a carryover from our 2017 predictions, that equipment manufacturers and would-be services providers remain in industry related conflicts as to which entity ultimately owns end-customer data. This has pitted original equipment manufacturers against major component suppliers, and has led to *M&A* consolidation efforts in some industries such as commercial aerospace and manufacturing equipment as to influence which constituencies will have ownership rights to end customer data and new digitally enabled services related business models. Some businesses have elected to accelerate *IoT* driven business transformation to gain first-mover advantage but we fear that those efforts will pause if customer data ownership is not resolved.

Blockchain Technology

With the pause in *IoT* investment, we continue to believe that *Blockchain* technology initiatives will gain added interest and momentum in 2018 because this technology responds to the needs for added data security and trusted network partnerships. The notions of distributed, trusted ledgers and auditability available to supply chain partners has appeal in the current data sensitive environment. High visibility pilots addressing challenges of food safety, transportation movements and new supplier certification have high appeal and potential for meaningful benefits. Government regulators have shown tendencies to openly support *Blockchain* technology efforts for the monitoring and management of regulated processes, and that will further open the door for more use cases and pilots to occur in the coming year.

Here again, the detriment to this technology remains the availability of generally accepted global standards related to either industry-specific or global electronic transactional ledgers. We therefore predict that the most important initiatives undertaken by Blockchain focused technology and services providers will be in cooperating on standards.

Further, technology providers that attempt to "*lock-in*" blockchain to an individual platform and use license will encounter market resistance and push-back.

Data Management

The year 2018 will provide a renewed emphasis on protections and safeguarding of customer related data. The motivations were noted in *Prediction Four*, the threat of more sophisticated cyber-attacks in the coming year. Also, the blowbacks from existing data breaches, in particular the Equifax breach allowing hundreds of millions of records related to sensitive customer data to be compromised.

This will force businesses and governments to re-double efforts to assure data protections, and that will conflict with ongoing beliefs that customer data is the new strategic asset for businesses. Thus, collecting customer data will need to be redefined into forms of selective data.

Since so many supply chain management processes interact and utilize direct customer data, such increased scrutiny and response will occupy initiatives and actions in the coming year. While marketing and supply chain management teams will clamor for the capture of all customer experience interactions, corporate compliance teams will be consumed with positioning and adhering to needs for protecting customer data.

The most near-term challenge is termed ***GDPR***, short for the ***European Union's General Data Protection Regulation***. The *Economist* termed *GDPR* as being the "*Dodd-Frank of data*." The principle behind this legislation is that privacy and ownership of one's personal data is considered a fundamental human right, especially when it pertains to online. The regulation not only applies to EU based activities but wherever personal data about EU citizens are processed.

GDPR is planned to be in-force in May 2018, and will in theory, strengthen the rights of individuals to control their personal data as well as stiffen the penalties against companies that misuse such data. The reality is that many EU and global companies are likely unprepared to understand and deal with the tenets of what will be required to be "*GDPR compliant*." Large organizations have indicated that the regulation will make it much harder to leverage customer data, particularly buying related data, in online and physical customer intelligence capabilities. Small to medium-sized organizations fear that such a regulatory burden will prove to have severe financial impacts related to conformance. Some predict lots of confusion and litigation, as well as an initial curtailing of the direct use of customer data until *GDPR* is sorted out.

In all cases, we predict that industry supply chain teams will be caught in the middle of such dynamics, with all sorts of initial confusing directives regarding how to collect and manage individual customer data. Some efforts toward enhanced customer intelligence and more predictive forecasting of expected customer demand may be temporarily derailed.

2018 Prediction Six: Make America Great and Changing Global Trade Policies Will Provide a Challenging Tactical and Strategic Landscape for U.S. Manufacturers

In 2017 we predicted that major developments surrounding global trade policies would occupy the attention of many industry supply chain strategists. The ascendency of President Donald Trump and the subsequent series of actions related to a ***Make America Great*** political agenda have added lots of uncertainties to current global trade policies and practices. Fortunately, our most dire predictions did not occur but 2018 provides another year of added uncertainties.

Heightened trade tensions continue in a current environment of better than expected global economic expansion. That can lead to heads-down complacency for industry supply chains to just go with the flow. The open question is whether another shoe will fall, whether that be ever more heightened tensions concerning North Korea's nuclear intentions, the ultimate result of the *Brexi*t and *NAFTA* negotiations, increased local trade provisions across the European Union, or which countries assume de-facto leadership in reconstituted *Trans Pacific Partnership* trade policies.

For these reasons, we are predicting that the *Make America Great* agenda opens the real possibilities of changed trade policies and that will provide a challenging tactical and strategic landscape for U.S. manufacturers, retailers and supply chain services providers in 2018.

NAFTA 2.0 **or Bust**

Experienced trade negotiators and political observers often point out that multi-lateral trade deals are more about achieving painful compromises while attempting to protect domestic industry interests. Yet, the ongoing negotiations to a reconstituted *NAFTA* continue to reflect a U.S. stance of a zero-sum, win-lose stance that could well drive major impacts to specific industry supply chains if *NAFTA* trade talks were to collapse in 2018. The clamor from U.S. based automakers, farmers, apparel, and consumer goods producers for the U. S. to take a more realistic approach are growing louder and so are the risks that walking away without any agreement will have tactical and strategic consequences. Some argue that the course has already been set for U.S. withdrawal.

The implication is rather than a revised *NAFTA* trade pact in-effect by the latter-half of 2018, businesses and their associated supply chains face significant uncertainties as to financial and bottom-line impacts. The *Trump Administration* and the *U.S. Congress* could evoke a six-month notification period of *NAFTA* withdrawal, or the *Congress* could elect to step-in and delay the withdrawal. Each scenario adds significant uncertainty for businesses and industry supply chains and begs the question of how and when to respond before impacts become more harmful to business interests.

China Trade Practices

Recent actions from the *Trump Administration* directed at China are also fueling concerns for a major escalation in trade conflict that has implications for industry supply chains.

Increased escalation of tensions between the U.S. and North Korea over nuclear and intercontinental missile intentions have snarled China as an intermediary influencer, while the *Trump Administration* threatens China with trade or business sanctions as a means of urging China to stop supporting Pyongyang regime.

The *Trump Administration*, along with the *European Union* are pursuing an agenda of hardball trade relationships with China, the latest being the reluctance to support China's petition that it be treated as a "*market economy*" under *WTO* global trading rules.

The U.S. has further declared specific objections to China's export policies with steel, aluminum and other products. A December 2017 editorial column by *The Wall Street Journal* observed that dumping allegations usually start when a specific company petitions the government, but the latest actions by the *U.S. Commerce Department* are self-initiated reprisal actions. In the case of aluminum, the *Commerce Department* imposed duties of 97 percent to 162 percent on Chinese produced aluminum foil, and the agency was investigating further actions related to common alloy aluminum sheets used in autos, construction, and home appliances. The implication is that a country branded as a "*nonmarket economy*" can be subject on higher duties on that country's exports. For its part, China's leaders have indicated that Beijing will take all necessary measures to protect the legitimate benefits of China's manufacturers.

These actions are likely to lead to more heightened trade tensions among nations trading with China and the United States, with any corresponding retaliatory trade actions impacting industry supply chains in the coming months. The significance and influence of China's manufacturing base serving as core capability of certain industry product value-chains, in a retaliatory trade environment cannot be underestimated as to its potential impact.

Meanwhile, China's ongoing ***Silk Road*** initiatives directed at physically linking China with Asia, India, the Middle East, Eastern Europe and Russia, continues to benefit from increased investment and supply chain interest levels. In 2018, the *Silk Road* will begin to be supplemented by a digital dimension with coverage of a satellite-navigation system connecting the upwards of 60 countries. What China has branded as ***BeiDou,*** or Big Dipper, a planned $25 billion investment in a network of nearly 30 satellites that will beam *GPS* data to *Silk Road* participants. The *Economist* characterized this effort as "*connecting the unconnected*" and delivering digital services to countries with limited access to the *Internet*.

Brexit Yes or No

With time becoming critically important to meet the March 2019 deadline for Britain's full exit from the *European Union*, there is growing skepticism that a new trade pact can be negotiated, outlined, and ratified by all *EU* nations by the early 2019 deadline. There further remains discord within political factions in London, Northern Ireland, and the rest of the U.K. as to what these negotiations ultimately lead to in trade practices, regulations and customs practices.

Industry and UK based manufacturers will continue to face difficult strategic investment, product sourcing and market distribution decisions in 2018. The U.K. serves a vital link in commercial aerospace, automotive, retail, and other industry supply chains. Currency, potential for added tariffs, labor and/or taxation provisions are prominent as is a sense of whether there will ultimately be a soft or hard exit. Domestic manufacturers will likewise continue to face difficult supply chain sourcing decisions in the midst of uncertain policy related to tariff structures with the EU and other countries.

TPP* Morphs to *CPTPP

President Trump's decision to walk-away from the *Trans Pacific Partnership (TPP)* has industry supply chain consequences as-well. Efforts are now underway to reconstitute *TPP* without the U.S. and with the potential of either the Eurozone or China becoming the dominant longer-term influencers of this trade pact.

In November 2017, under the active leadership of Japan, a reconstituted trade alliance, termed as the ***Comprehensive and Progressive Agreement for the Trans-Pacific Partnership*** or *CPTPP*, consisting of potentially 11 global nations began to take hold. Ministers from these nations issued a joint-statement indicating they had agreed on core principles.

The revised CP*TPP* has dropped the 20 prior U.S. provisions such as increased intellectual property protections for pharmaceutical, drug, software, and high-tech products and for expanded access for U.S. logistics and transportation firms such as FedEx and UPS. U.S. exporters will likely be unable to take advantage of proposed lower tariffs on thousands of products if member countries ratify the revised pact.

Participants in this revised alliance include Canada and Mexico, which adds more complication to *NAFTA* negotiations. Other countries that are being urged to join are Indonesia, the

Philippines, South Korea, Thailand, India and China. The latter in-essence negating the original goals of the former *Obama Administration's* "*Pivot Toward Asia*" strategic defense and global trade strategy.

While the *CPTPP* is noted as still far from a completed trade pact, ratification of such an agreement, most likely in late 2018, will place U.S. manufacturers at a distinct disadvantage to *CPTPP* members for doing business in Asia. That will be a compelling setback for growing international revenues.

Rising Trade Barriers Within the European Union

While unfettered global trade remains the stated principle of the 28 countries that make-up the *European Union*, voter concerns that free trade has jeopardized domestic industries and jobs has led to a series of new measures that favor local producers or modify trade practices in favor of individual country markets or labor pools. The implication is that multinational companies and their associated supply chains, that fostered business strategies for selling and distributed of standardized products across the *EU* are now running into localized country-by-country exceptions. Examples are new food labeling and origin certification requirements in France and Italy or a German requirement that plumbing products contain only alloys authorized by the German government. Such variances directly impact product verification, selling and distribution strategies and could likely become more complicated in the months to come.

For all of the above, International Sourcing and Supply Management strategy assessment will remain a key competency in 2018.

2018 Prediction Seven: Global Transportation Carrier Network and Third-Party Logistics Strategies Turn Towards Achieving Added Scale

For the fourth consecutive year, we are compelled to include a prediction related to global and regional transportation and logistics industry capabilities and their changing industry dynamics impacts on multi-industry supply chains and parcel recipients. The reasons are again obvious, namely that immutable multi-industry digital commerce adoption trends, especially in consumer retail and *B2B* commerce sectors continue to drive both explosive growth in transportation, customer fulfillment logistics and real-estate needs, but at the same time, drive more rapid forces for industry transformation or consolidation in order to leverage market scale.

Consumers continue to demand multiple forms of online buying experiences, and parcel logistics and transportation is now the lifeblood of completing the retail experience according to customer requirements. The open question remains whether such trends operationally and financially benefit customers, shippers and industry supply chains, or individual carriers, services providers or private equity firms looking to cash-in on the unstoppable march to online.

Because of such forces, we predict continuous developments and announcements in this sector, including new strategic alliances, mergers, added acquisitions and some fallout. Some of these announcements could be significant and far reaching similar to Amazon's prior strategic move to institute expanded global transportation and customer fulfillment logistics capabilities.

Background

Two years ago, many would not have predicted that **Amazon** would become a significant transportation and last-mile logistics and customer fulfillment provider in 2018, and yet that is now reality. Similar to *Amazon Web Services* (AWS) providing an on-demand IT and computing services utility for a diverse collection of customers, *Fulfilled by Amazon*, *Amazon Prime and Amazon Business* are now providers of inventory management, online buying platform, parcel transportation and last-mile fulfillment for goods producers. The same could be stated for China based **Alibaba**, which owns its own logistics and transportation network capabilities across China and other Asian countries. Each has become an alternative provider to a DHL, FedEx or UPS.

As more varieties and sizes of products continue to be offered as an online buying option, specialty white glove logistics and transportation providers have been able to launch new business models to service such needs while competing with traditional global parcel carriers.

Cascading various tiers of respective industry supply chains, ocean container industry leader ***Maersk Line*** is in the process of expanding ocean shipping to broader inland logistics and services capabilities. Likewise, large trucking firms have expanded in specialty services for supporting goods producer needs to support multi-channel online fulfillment. All such industry movements blur the lines of demarcation.

At the same time businesses remain under intense pressure to protect core product design and management capabilities but seek opportunities to outsource product value-chains to more specialized services providers including integrated logistics and transportation service providers. Similar to many other industry trends, physical, technology and services network scale and customer leverage has become the corner stone for long-term growth for revenues and profits.

Competing or Converging Networks

We predict that 2018 will be the year where major parcel transportation and customer logistics networks step-up their competition for the mindshare and broader influence of larger numbers of online customers or online platform providers.

Up to now, global services providers like DHL, FedEx and UPS have utilized annual rate hikes and added surcharges to meet objectives for both the need for adding more network scale while managing stockholder expectations for more timely returns on their investments and on the growth prospects of the online economy. That strategy is wearing thin, especially when considering the hundreds of millions of dollars required to sustain and grow such networks and the supporting advanced technology. Added investments in capacity, automation and soon, autonomous transport vehicles including drones, add to the capital investment burden.

Consider today's analogy of shared rides, where vehicles labeled or branded as *Uber Didi Chuxing*, *Lyft*, *MyTaxi*, *BlaBla Car* and others, traverse urban streets waiting for online engagement. Consider the notions of a shared network resource, where technology engages the closest available car service, along with choices in total ride cost.

These scenarios now begin to apply to logistics fulfillment platforms with branded names. Consider online customers being offered choices such as same-day or next-hour virtual courier, FedEx, UPS, national postal carrier, each with a cost and service bid offered to the customer. Consider existing online retailer platforms offering the same choices but with owned or contracted carriers.

The takeaway is that 2018 will present additional actions by major logistics and transportation network providers to achieve such scale and influence. These will likely include added strategic alignment of networks, and more and larger merger and acquisition announcements, perhaps on a far larger scale.

Some specialty logistics third-party services and transportation providers will come to the realization that investment is best served by either becoming an extension of large existing online retailer, or being acquired by such retailers, particularly for specialized logistics services. One example came in December 2017 with the announcement from Target that it would acquire grocery delivery start-up ***Shipt***, a direct competitor to *Instacart*, for $550 million. Plans call for Shipt to operate as a business subsidiary, and maintain partnerships with existing grocery retailers, an implication that Target seeks to both utilize and grow the online delivery platform. In December, a published report by *Recode* cited a source indicating that retailers **Home Depot** and **Amazon** both expressed interest in acquiring **XPO Logistics**, but that has not be verified by mainstream business media. Such reports do however reinforce the desire for added logistics scale.

We would not at all be surprised that integrated online and in-store retailer Walmart partners for shared logistics services for customers, or acquires added last-mile customer fulfillment capabilities, or offers its own premium logistics fulfillment capabilities for online customers.

Further, as Amazon continues with the integration of food retailer **Whole Foods** as an integral part of its fresh foods retailing strategy, we would not be surprised if a major food broker and distributor becomes an exclusive partner to Amazon for expanded downstream acquisition and distribution for fresh food products.

In short, 2018 will be the year that features physical or virtual scaling of online logistics fulfillment networks among multiple retail, grocery, and other product and services categories, accomplished by large money flows or technology investments. The open question remains as to which online consumers, providers or existing transportation and logistics platform providers benefit the most in the coming months.

Supply chain logistics and customer fulfillment teams will therefore need to be watchful, diligent, and patient in 2018 as market forces shake-out efforts toward achieving domestic and global scale. That stated, transportation procurement teams should remain aggressive in rate and surcharge negotiations, reinforcing that enough is enough and that parcel logistics and transportation carriers need to turn to other funding sources for added scale.

2018 Prediction Eight: Positioning for Global Retail Dominance Will Shift into Higher Gear with New Providers Serving as Spoilers

This prediction is an extension of our 2017 prediction regarding **Alibaba** and **Amazon** continuing to position for online retail platform dominance.

Both global retail platform providers are extending capabilities that include *B2B-to-B2C* and pure *B2C* fulfillment in strategic global geographies, with the Asian region being a key target in terms of long-term growth. We predicted that Alibaba would likely be the wild card in built-out capabilities for supporting large-scale online and physical cash payments in supporting customer fulfillment logistics infrastructure. That indeed occurred, but Alibaba further stepped-up efforts to invest in or partner with major in-store retailers to be an extension of the online experience.

In 2018, we anticipate such positioning to shift into higher gear and all the signs point to an end-state of overall retail that will include combined online and physical store experience and fulfillment elements. As we publish our prediction in early January, Loup Ventures equity analyst Gene Munster has boldly predicted that Amazon will acquire U.S. retailer **Target** in 2018, described as: "*the ideal offline partner for Amazon*."

Some describe this as the tipping point for retail business or a bricks-to-clicks transformation where retail stores are strategically located in key buyer population regions, and where a physical retail presence serves as the extension or fulfillment capability of the online shopping model affording customer broader options. The implications of moving from distribution center to store fulfillment, towards distribution and distributed customer fulfillment supported by optimizing overall pools of inventory is a far different management model. Alibaba and Amazon are leading the way in ongoing development and automation of such models.

Such an expanded strategy adds the potential for emerging industry spoilers, and we anticipate that **Walmart** is likely to be such a spoiler. Since this retailer's acquisition of *Jet.com* and other specialty boutique online retail platforms, a discernable strategy is evolving that has captured the interest of many in the industry. Some believe that Walmart may have finally figured out a new retail strategy that leverages branding as the lowest-cost retailer with elements of online and strategically-located physical stores in a combined retail fulfillment capability. While the bulk of current efforts are focused in the U.S., Walmart is choosing partners in China and other regions. Other players may emerge as spoilers as well.

In 2018, clients and blog readers should keep an eye toward the ongoing actions and positioning of what may be the dominant retail players for the next decade. The stakes are high, the moves are bold and the learning along this path will be very insightful in planning for support of the new online economy.

2018 Prediction Nine: Supply Chains Will Begin a Discernable Multi-Year Transition Toward Digitally-Enabled Response Networks

For 2018, we have added an admittedly multi-year perspective prediction, one that will require assessment and longer-term planning across multiple industry supply chain and related services providers over the next few years.

There is little doubt that the movement toward online is having compelling implications on *B2B*, *B2C* and *B2B-to-B2C* customer fulfillment expectations and required experiences. The term "***The Amazon Effect***" has clear meaning and new trepidation for many manufacturers, retailers and services providers as existing industry business models continue to be disrupted.

The future on-demand economy is now an unstoppable force. where customers and consumers will continue to expect a seamless buying experience, and where continuous industry disruptors strive to market, influence and distribute innovative experiences directly to consumers and businesses. Competing in the new retail economy requires closing the gaps between product design to actual B2B response to customer experiences. How such experiences are supported, managed and synchronized leads to what we have termed as ***Digitally Enabled Response Networks***.

To research and formulate this prediction, we had the opportunity to speak with a few technology executives regarding what to expect in the on-demand experiences movement.

Roei Ganzarski, former Boeing executive and now *President* and *CEO* of technology provider **Bold IQ** articulated that on-demand services, including anything from ride-sharing to food delivery are quickly becoming a necessary expected service in the *gig* economy. The online customer expects his or her fulfillment expectations to be seamlessly met by an online provider whereas many of today's online response streams are driven from a supply chain constraint business model, where the online customer often has to wait for an individual supply chain to respond to such demand. Ganzarski went as far as to declare that today's supply chain models are increasingly falling short on the ability to optimize for the expected online experience: "*Today's online consumer expects to purchase a product when he or she wants it, and delivered in the fulfillment channel most desired, as opposed to when the supply chain can best respond to such needs.*"

Sue Welch, CEO of Retail *PLM* platform provider **Bamboo Rose** noted that in 2018 and beyond, there will be even greater impacts on speed-to-market with augmented reality, 3-D modeling and AI/Machine-learning capabilities. In an interview, she indicated that a retail misnomer is often that consumers will tell you what they want, but rather, consumers desire new choices, styles or experiences. She described the concepts of ideation and hyper-curation, the notions of not having fixed lead times govern time-to-market but rather the screening of unique product design attributes, characteristics and pricing points of products. Co-creation and leveraging the knowledge base and capabilities of suppliers can springboard the response network and provide retail buyers with timelier product choices.

In other words, it is no longer a supply chain capability but rather a digitally-enabled response network that leverages multiple demand sensing, *IoT*, predictive and artificial intelligence enabled technologies to connect the digital with the physical assets of the response network.

As analysts, we often articulate moving from an inside-out response capability to that of an external outside-in capability. The new, digitally enhanced online model moves to the next dimension which is continually synchronizing the response network to meet customer expectations. The end-state network includes elements of a product-value chain, product supply and services. It is the integration and synchronization of:

- Individual and collective product and services focused supply chains into a singular response network.
- Linking physical and digital capabilities.
- Leveraging of *IoT*, *Manufacturing 4.0*, *Blockchai*n, *Predictive-Cognitive* and *AI*-based decision-making technologies to manage network synchronization, risks, and unplanned exceptions.

This is a multi-year journey of transition and it initially begins with broad education and the conscious use of different terminology to describe what the end-state capability will provide in terms of people, process and technology dimensions. Some leading-edge innovative supply chain organizations will begin such transformation in 2018, and we will strive to bring some visibility to such efforts. Industry-wide developments that reflect movement to this end-state capability, along with the technologies that are leading the way will be further profiled.

We will also make conscious efforts to change our own communication terms in the coming year. That includes less emphasis on the “*Supply Chain*” in favor of more emphasis and meaning to “*Response Networks*” and responsive capabilities in the context of digital business models.

2018 Prediction Ten: Unique Industry-Specific Supply Chain Challenges

Each year, we include industry-specific supply chain focused challenges that we believe will be unique and dominant within the coming year. For 2018, we are including the following industries under this section:

Automotive and Truck Industry Supply Chains

Electric Vehicle Strategic Sourcing

The all-in industry movement toward development and production of far larger numbers of electric and hybrid powered cars and trucks requires stepped-up efforts in comprehensive global strategic sourcing and supply management strategy as well as a longer-term infrastructure readiness strategy. In 2018, the challenge will be global *OEM* efforts in locking in strategic supply of the battery component value-chain that includes long-term supplies of lithium, cobalt and copper. There will also be efforts to influence the epicenter of battery technology advancements and production among either China, Japan or the U.S. and Europe.

NAFTA 2.0

If *NAFTA 2.0* trade talks collapse in 2018, automotive supply chains will experience meaningful impacts as to product margins and longer-term production sourcing strategies.

Individual Brands

Tesla will likely experience additional challenges in ramping-up *Model 3* production volumes motivating the need for bolder production and supply chain capability moves or loss of competitive advantage. Chinese or European start-up disruptors will challenge Tesla for consumer mindshare, but **General Motors** and/or **Toyota** will leverage existing global supply chains and production capacity to gain market and mindshare advantage.

Anticipate more industry M&A activity spanning the broad vehicle product value-chain as companies position for greater leverage and control of an industry that brings together autonomous, shared-ride and electrically-powered vehicles to global markets.

Commercial Aerospace Industry Supply Chains

Commercial aerospace supply chains will likely run into more potholes in plans to scale-up production levels and satisfy investor interests for greater short-term returns. Like 2017, select aircraft engine producers will be the critical dependency in accelerating production cadence with **GE Aerospace**, **Pratt** and **Rolls Royce** being suppliers to watch.

Industry supply chains may require some altered component sourcing depending on the clarity and progress of ongoing *Brexit* trade negotiation in 2018.

M&A among key industry component supplier community will likely continue in 2018 as will efforts pitting global OEM's Airbus and Boeing against key suppliers in controlling the aftermarket services and repair parts market segment.

Airbus will tackle a special challenge in that many key senior executive leaders have announced their exit in the next two years with senior leadership continuity of new product development and ongoing supply chain scale-up strategies being an important consideration.

With Airbus as a new strategic partner, the *Bombardier C-Series* aircraft will secure additional order volumes.

Consumer Product Goods Industry Supply Chains

The online direct-to-consumer distribution model explodes with added emphasis on fresh food and consumer products direct distribution. Such efforts will directly impact existing logistics and distribution strategies.

Expect continued M&A among major CPG, Food and Beverage manufacturers, perhaps one or two major acquisitions involving global brands will add more disruption to respective impacted supply chains.

Walmart and **Amazon** will continue as tough price negotiators resulting in aggressive industry-wide price competition. Suppliers will walk a fine line in balancing cost vs. volume output strategy needs.

Multi-Industry Online Commerce

Amazon's multi-faceted strategy leaps will likely stumble due to the managing of too many market disruption thrusts, while others gain some traction in online customer fulfillment and execution. Cost affordable real-estate becomes a bigger challenge leading to further consideration of contracted or *3PL* outsourcing in online fulfillment.

High-Tech and Consumer Electronics Supply Chains

All eyes will be on **Apple**, and on the product management and supply chain network efforts to scale-up production levels of the *iPhone X* and *iPhone 8*. Similarly, what Apple elects to do when the company re-patriots its vast sums of cash parked in foreign accounts, and whether that implies added stock buybacks, significant added value-chain investment or a major acquisition or entirely new product entry will be areas that the industry will monitor closely.

If in 2018 trade relations involving the U.S. and China result in punitive tariff and other trade actions, high-tech and consumer electronics supply chains will experience meaningful impacts.

Final Note

That concludes our predictions for industry and global supply chains in 2018, a year that promises healthy top and bottom-line economic growth but again coupled with noticeably higher industry and global supply chain risks. The needs for supply chain digital transformation will become more compelling as will be more leveraged application of advanced technology.

As is always the case, supply chain management teams will meet these various challenges and along the way, will come-up with even more innovative business processes and leveraged use of technology.

The Ferrari Consulting and Research Group looks forward to continuing to serve your supply chain research, business process transformation, risk management, IT advisory and consulting needs.

We extend our best wishes for a very productive and rewarding 2018.

The Ferrari Consulting and Research Group LLC and Supply Chain Matters Blog

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