Issue 16 | 2017

## December



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**Rutgers University Supply Chain Association** 



Rutgers University Supply Chain Association



Shaping the world's future Supply Chain leaders

## **Paradigm Shifts**

Change can come in an instant and before we know it, industries we thought would stand the test of time are left behind and new ones are before us. In our final newsletter for the Fall 2017 Semester, we discuss the takeover of automation from the fast-food to the trucking industry and the potential that 3D printers have to those who yield them. However, it's not just innovators that are shaping the playing field as we see with the Brexit talks. So it's only apt that RUSCA hears from Professor Kevin Lyons about the importance of sustainable supply chains in dealing with the many curveballs that come our way. RUSCA would like to thank the Newsletter team and the SCM Department for a successful Fall 2017 Semester and wish you all a Happy Holidays. See you next Semester!

**Chris Doyle** | Editor-in-Chief **Brandon Daley** | Assistant Editor

Newsletter Formatted by: **Michelle Fu** 

RUSCA is now a recognized affiliate of ISM, the largest international professional supply management organization!

For RUSCA-specific events, see page 11

## **Supply Chain Supplements**

## In Case You Missed It

Sears, the everyday retailer, has begun shifting focus to their strongest business segments: mattresses, appliances and car service, all while shuttering their weakest performing general department stores.



Sears, which has suffered declining sales at both its Kmart and Sears locations for several years now hope to arrest these trends by focusing on specialized store openings in Pennsylvania and Hawaii to go along with Colorado and Texas from earlier this year. Sears holdings has also planned for a reduced footprint by moving away from more supply-chain intensive retail products such as apparel wear.



After 6 months of partial activity, Grainger's new 1.3-million square-foot distribution center in Bordentown, New Jersey is fully functional marking 3 years since their move from their Robbinsville, NJ campus.

Currently the largest commercial warehouse in New Jersey, the mile-long campus is expected to employ over 600 people by January. The decision to situate in Bordentown was due to the proximity to customer populations that would enable next-day delivery, all while taking advantage of cheaper land. The warehouse, which had been of concern to many nearby homeowners, has been sending out 30 to 40 trucks for over 35,000 order lines every day for the past 6 months to zero-complaints from residents.

Christmas tree prices are expected to spike 5-10% according to Doug Hundley, spokes-person of the National Christmas Tree Association. Supply in the interim appears to be fine, but could be a cause for concern for late purchasers and future Christmases.

Price rises are due to shortages from leading producers in North Carolina and Oregon. The dilemma stems from the Great Recession when

growers failed to sell their trees and so could not replant new saplings to expand their future supplies. It takes 10 years to grow a 7-8 foot Christmas tree. This current situation has forced vendors to procure from new suppliers at higher prices and has forced loyal customers to either pay more money for their favorite fir, to begin shopping sooner or to settle altogether on buying a tree elsewhere.

Microsoft recently implemented SAP Ariba to streamline its digital supply chain services. The shift will consolidate platforms and better the company's communication with retailers



and customers. It will also heighten flexibility for the company to integrate their 2nd and 3rd tier suppliers. Onboarding which usually lasted 3-4 months, will now only take a matter of weeks.

The adoption of SAP Ariba aligns with Microsoft's desire to push technology forward. The company's current offerings of Xbox One X and Surface Pro has necessitated a more sophisticated supply chain presence. With competitors Apple and Samsung operating in similar fashions, time is crucial for Microsoft so being able to respond 3 days quicker enables them "to leverage supply where their competitors move slow and are at a disadvantage," according to SAP Vice President Keith Baranowski.

# Event Recap: Kevin Lyons Talks Supply Chain Sustainability at Rutgers and Beyond

## BY: KEVIN RESHAMWALA

These days, "green" has become a buzzword in the business world. We hear it in every industry and business function, especially in supply chain management. But what exactly does it mean to become green? How does a corporation "green" its supply chain? How do we strike a balance between making money and being green? Kevin Lyons, associate Rutgers professor and veteran environmentalist, gave us insight to these questions and much more at our last RUSCA meeting.

Being green means to work for eco-friendly solutions that protect people and the environment, something Kevin Lyons has done his entire supply chain career. At sixteen years old, he went straight from high school into the U.S Military. He was stationed throughout the world, including Greenland and Iceland (which were not exactly favorites of his.) However, during this time, he learned the in's and out's of procurement and contracting. One notable contract required for him to procure chemicals to eliminate gophers that were infesting the military base. But being a staunch environmentalist, Lyons looked the problem from a unique angle; instead of using harmful chemicals, he employed the use of blow darts to tranquilize and relocate the animals. The idea was a success: he saved the military \$75,000 and received a Commendation Medal for his ingenuity, but more importantly, he set the standard procedure for dealing with animals on military bases.

Lyons took his career in a new direction by joining Rutgers University's Procurement and Contracting Division in 1988 as a Buyer. One of his most important tasks at the time was to contract a waste management program for Rutgers, after New Jersey recently passed into legislation this new idea called recycling. At the time, Rutgers was spending \$45 million on garbage disposal. After careful analysis, and over time, his team has managed to develop waste profiles for all purchased products and reconfigure those supply chains. For example, he decided that computer suppliers should take back the boxes in which the product was shipped. This and many other ideas were the foundation of including a waste management perspective into all future contracts; as a result, Rutgers is now recycling 63% of its waste, and a leader amongst universities. Moreover, Professor Lyons has pushed many other green purchasing initiatives at Rutgers. For instance, he negotiated contracts for the solar panels in the Livingston parking lot, allowing the campus to go 65% off the grid. He also facilitated the construction of approximately five hundred pipes underneath the empty seven acre field between the Janice H. Levin building and the Livingston Student Center. These pipes extract geothermal energy to heat and cool the buildings across the campus, and have saved the university \$25 million in project costs. He also arranged for the cooking grease in Rutgers Dining Hall Kitchens to be converted into biodiesel fuel for UPS and FedEx, which has resulted in a reduced price for Rutgers for UPS and FedEx services.

Kevin Lyons' continuous work on supply chain sustainability sheds light on the growing convergence between environmentalism and business.

"Overall, environmentally-sound businesses are only as strong as its leaders. Kevin Lyons and others like him are paving the way, professionally and academically, for people to get involved in the Green Movement."

Increasingly, corporations around the world are reshaping their business models to be more eco-friendly. Manufacturers are devising ways to minimize their carbon footprints. And customers are carefully selecting products and services based on their environmental impact. Skeptics may suggest that having a low carbon footprint and high profits are mutually exclusive. However, if we have learned anything from Lyons' career, it is the fact that going green is profitable. As his career has shown, making eco-friendly decisions can reduce costs and increase efficiency for any type of business. In addition, all of us understand that "the money to be made" is always in the next industry, not the previous one. Case in point, in terms of electricity generation, the solar power industry now employs more people than oil, gas, and coal combined. Just like computers replaced typewriters, environmentally friendly renewable energy sources should replace fossil fuels.

Overall, environmentally-sound businesses are only as strong as its leaders. Kevin Lyons and others like him are paving the way, professionally



and academically, for people to get involved in the Green Movement. Interested Rutgers students can take his "Supply Chain Environmental Management and Green Purchasing" course to obtain a more nuanced understanding of this area. Moreover, students can take certification exams in various areas such as Life-Cycle Assessment, Lean and Six Sigma, as well

as Energy Star. Also, Rutgers is always giving students the opportunity to work on industry client projects involving supply chain sustainability in a variety of fields. But most importantly, companies are paying top dollar for individuals with proven knowledge in greening the supply chain. So not only is environmentalism key for businesses, it will also be key for supply chain professionals to think with that perspective moving forward.

## Hamburger Making Robots...What?

## **BY: KIERAN WILLIAMS**

Robots are officially taking over and I'm not sure how I feel about it. Founded in 2009, Silicon Valley start-up, Momentum Machines, is in the works of opening up a burger joint where the cooks are robots. Yes, robots. Eliminating the equivalent of three human workers, these robot can grill a beef patty, cut lettuce, tomato, and onions, and then assemble and package the burger all on its own. At a production rate of 400 make-to-order hamburgers per hour, this burger making robot is here to takeover (KWHS).

Momentum Machines has currently raised \$24 million dollars from investors such as Google and Khosla Ventures and has been itching to find a retail location since June of 2016 (Bort). San Francisco currently houses robots

"...what exactly does it mean to become green? How does a corporation "green" its supply chain? How do we strike a balance between making money and being green?"

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Though robots can be a great alternative to human work, it may not be all so cost-friendly. Yes, the thought of a fixed cost robot compared to a waged employee is attractive but when you take into account the maintenance and repair costs of up-keeping a robot working, it's a different story." who run food deliveries for Yelp's Eat24 service and pour coffee at Cafe X, but nothing quite like this. While these robots can do just about anything, humans beings are still necessary at the retail location for the time being at least. Custodial and front-of-house staff members are crucial in running the restaurant smoothly.

There is no doubt this technology and concept is incredible, but are there any downsides to their release? Co-Founder of Momentum Machines,

Alexandros Vardakostas, states, "Our device isn't meant to make employees more efficient, it's meant to completely obviate them" (KWHS). At first this technology seems very viable as it can cut business expenditures significantly between



wages and some overhead costs, but it would also introduce new maintenance costs. It would also introduce a potential new issue: the eradication of opportunities that these jobs provide some people. Many high school and college students use these jobs to make money and gain relevant work experience to start their professional careers. Minimum wage jobs allow teenagers to gain a head start and obtain real-world experience. Less technical positions such as these enable them to gain transferable skills without much prior experience. It is a question of how do we balance the business side of things with the social responsibility businesses have to those entering the workforce.

Though this trend may be the beginning of what consider the complete automation of U.S. jobs. PwC explains how 38% of jobs within the United States could be at risk of automation, compared to 30% in Britain, 35% in Germany and 21% in Japan (Masunaga). When you think about it, given the proper technology, many jobs can be easily replaced by automation. Jobs that require little education are prime candidates for replacement. Jobs in hospitality transportation and storage are at high risk of automation and may potentially go the way of Momentum Machines.

Though robots can be a great alternative to human work, it may not be all so cost-friendly. Yes, the thought of a fixed cost robot compared to a waged employee is attractive but when you take into account the maintenance and repair costs of up-keeping a robot working, it's a different story. Engineers, business owners, and the economy need to take all this information into consideration before implementing such technology. Steven Mnuchin, the U.S. Secretary of the Treasury, recently told Axios Media that "I think we're so far away from [robots in the workplace] that it's not even on my radar screen" (Masunga). This technology has the possibility to make business incredibly more efficient, but it is worth considering the potential elimination of jobs and opportunities that people need?

All in all, I can see Momentum Machines being a huge success. From a customer experience perspective, the experience of walking into a restaurant and dealing only with robots is sure to attract some curious customers. How far out of Silicon Valley can this business model grow is a good question. Regardless, I think I'll plan on visiting San Francisco soon.

## **Are Self-Driving Trucks Really the Future?**

## BY: MIKE MCGUIRE

Logistics is the detailed coordination of a complex operation involving people, facilities, and materials. For a supply chain to be successful, one must emphasize the importance of logistics as logistics is the backbone to the numerous parts of the supply chain. This is the reason many companies take logistics so seriously and why self-driving trucks are now a hot topic in trying to enhance the performance of one's logistics. Two major benefits are the efficiency it provides over that of a human and the potential cost effectiveness of the innovation. The potential results of a quicker, more reliable transportation network has been driving its development in recent years with companies and investors investing one billion dollars into the technology. A sum that is ten times that of three years ago (Dougherty). Investors are trying to get self-driving trucks on the road as soon as possible so there is reason to believe fully automated self-driving trucks will be here sooner rather than later.

One key reason behind investments in autonomous trucks is the potential cost savings. In the United States, drivers are limited by a 14-hour driving window before they are mandated to be off-duty for a consecutive 10 hours (FMCSA). Such legislation, while it enforces driver safety, extends the total transportation time. It also opens up for potential risk of theft when during that off-duty period the product is stationary. With self-driving trucks, the trucks can operate continuously therefore mitigating the two aforementioned issues associated with human drivers. Self-driving trucks also eliminate human driving error, which is common in the truck driving occupation. "The industry spends billions of dollars a year on accidents that are largely caused by human error, and billions more on insurance premiums that should go down if and when self-driving" technology arrives (Dougherty). The amount being spent on accidents is huger. So technology that could reduce those costs should result in great demand for these trucks. This will have a ripple effect because a safer and more secure truck means cheaper insurance premiums and overall labor costs.

Self-driving trucks still have plenty of work ahead of them before they are on the road. Companies face many legal challenges to get them approved



as well as technological hurdles. These trucks are currently being tested by professionals who sit behind the wheel with a passenger working on the computer that controls these trucks. Whenever the driver feel the need to step in to help the truck stay on the road or avoid any glitches he or she will do so. The passenger

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The potential results of a quicker, more reliable transportation network has been driving its development in recent years with companies and investors investing one billion dollars into the technology. A

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that of three years ago

takes notes and sees what needs to be fixed on the computer. "At one point the computer's "vision" briefly lost sight of the freeway because an overpass shaded the road" (Dougherty). This is an example of a kink in the armour that will need to be perfected before any truck gets onto a highway alone.

Stories of technological mishaps like these scare many people. They believe these trucks being tested at the risk of civilians is not a smart idea. Many argue that a driver in the cab of the truck cannot control the whole truck in time if the computer glitches. "A fast, hard turn of the steering wheel at high speed would set the truck to fishtailing and possibly jackknifing" (Freedmen). It highlights the need for these very strict and thorough testing stages before its release.

Those testing stages may be closer to being finished than we think as Elon Musk recently announced orders from J.B. Hunt and Walmart for Tesla's semi-autonomous trucks for 2019. This will be a major stepping stone toward for the industry and the possible future of fully-autonomous trucks. "The Semi is designed to run up to 500 miles on a single charge, and incorporates Tesla's semi-autonomous driving system," which operates via driver and computer system (Smith). Depending on the results of Tesla's semi-autonomous trucks, many citizens and companies may begin to warm to the idea of fully autonomous vehicles and other large companies will realize the potential costs savings.

The potential of self-driving trucks to enhance the speed of transportation is astounding and the money being invested reflects this. However, we still have some time before the truck is fully developed and fully accepted. When this product is fully ready it will eliminate many current inefficiencies and improve the overall quality of a business' logistic operations which is key to having a successful supply chain.

## **Rolls Royce: The Fear of Brexit**

## BY: ADARSH RANGAN

On March of 2019, The proceedings for Brexit will officially be put in motion and the United Kingdom will become wholly independent from the European Union. While Brexit may seem like the lofty idea of self-determination expressed within a modern context, it highlights serious concerns from an

economic perspective. Members of the EU benefit from lax border regulations ushered in during a period of globalization that began transforming the world. Free Trade Agreements became commonplace as nations prioritized the easy movement of



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Goasduff, Contributor: Laurence. "Brexit: Logistics Leaders Face Complexity and Cost Implications." Smarter With Gartner, Gartner, 13 Oct. 2017, Web. goods and specialized in their competitive advantage while trading for all else. In this interconnected world, supply chains grew tremendously as logistics and transportation became simpler and more cost effective. That progress has however regressed as political rhetoric began condemning globalization due to the problems it caused at home. Brexit was perhaps the biggest impact of the change in rhetoric. Supply chains, which had once greatly benefited from free trade would now take a huge blow. Rolls Royce, a luxury car brand and pre-eminent engineering company, is one such company that has cited serious concerns about the impact Brexit could have on its supply chain and ultimately its business.

Brexit would return economic relationships between countries back to when borders were hard. Hard borders are characterized by significant border inspections and heavy taxation of imported goods. If the EU were to force goods originating from the UK to significant tariffs, Rolls Royce could see its prices rise significantly compared to its competition. Moreover, significant border inspections would slow the movement of product across borders and increase the lead time for Rolls Royces. Business leaders in the UK hope that



during negotiations, the UK will not be subjected to hard borders, and that regulations and taxes will be close to pre-Brexit standards. The fears of hard borders have prompted Rolls Royce to act. The CEO of Rolls Royce, Warren East, wrote to his employees, "tariff barriers"

would mean higher costs and higher prices...Our employment base could also be affected" (Whyatt). That concern extends to union leaders, who predict that the rising costs due to Brexit could directly impact jobs at home. As costs rise, companies often seek to balance their finances by cutting their own highest cost - labor. Moreover, to stymie operating costs, Rolls Royce could move the primary manufacturing of its products from Derby, England to Germany or other manufacturing locations. Union leaders estimate that through 2022 nearly 5,000 jobs could be lost in Derby alone (Asthana).

This is rather surprising as protectionism is oft seen as the solution to a nation's economic ills. At its peak, globalization allows every country to focus strictly on its own competitive advantage. Local industries that operate outside of that advantage will face significant competition from other nations that already specialize in that category. Take farmers for example. Local farmers face tremendous competition from foreign producers that have invested immense capital and resources to produce significant volume at a low cost. Local farmers are easily washed out of competition and thousands of people lose their jobs. However, Brexit and the likely accompanied protectionist policies could prevent foreign entrants from rivaling local producers and thus create more opportunities at home. However, rising costs has led companies such as Rolls Royce to outsource manufacturing jobs to other countries, especially those still safely within the EU. As Rolls Royce ships jobs out, there is a

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The issue faced by Rolls Royce is simply a snapshot of a much larger and more concerning picture. Rolls Royce is not the only UK based company facing significant increases in supply chain inefficiencies and costs. Cost reducing measures such as outsourcing manufacturing could impact jobs at home."

loss of jobs within the UK, which is the opposite of what protectionism ordinarily produces.

The impacts to jobs is merely a symptom of a greater issue faced by Rolls Royce. Rising supply chain costs are inevitable. Greater customs control will increase transit times and multiply the administrative burden for organizations (Goasduff). As negotiations take place over the next few months, demand variability will increase as companies re-evaluate their partnerships with UK based companies. Brexit will truly test the agility and flexibility of these supply chains (Goasduff). The leadership of Rolls Royce has expressed serious concern over these supply chain costs. Rolls Royce predicts a loss of approximately 4 billion euros or almost 5 billion dollars due to various supply chain costs from Brexit (Ruddick). These losses will be monumental if Rolls Royce cannot find the means to cut costs and implement supply chain alternatives with haste.

The issue faced by Rolls Royce is simply a snapshot of a much larger and more concerning picture. Rolls Royce is not the only UK based company facing significant increases in supply chain inefficiencies and costs. Cost reducing measures such as outsourcing manufacturing could impact jobs at home. Unless significant steps are taken, Brexit could become a lose-lose situation for UK based companies and employees.

## 3D is More Than a Movie Experience

## BY: SOMIK SHAH

A new technological change that could completely revamp supply chains is additive manufacturing, better known as 3D printing. For those who have yet to hear of it, 3D printing is the creation of physical objects from a

digital file executed by layering horizontal cross sections of an object. To put it simply, the 3D printing of objects is similar to stacking pieces of paper on top of one another. The reason 3D printing are a game changer is because companies, such as those in the aircraft industry, have been using them



to successfully reduce costs and development time, thus contributing to a leaner overall supply chain.

Foremost, General Electric, GE, used additive manufacturing in the production of almost 85,000 LEAP Jet engines. GE began their LEAP Jet engine projects with a goal of reducing fuel consumption via a new fuel nozzle manufactured using traditional methods. However, GE was unable to successfully weld together the 20 necessary parts due to its complexity. As a result, GE utilized its partner, Morris Technologies, to develop a prototype for the LEAP Jet Engine fuel nozzle using 3D printing. The new fuel nozzle was 25%

The reason 3D printing are a game changer is because companies, such as those in the aircraft industry, have been using them to successfully reduce costs and development time, thus contributing to a leaner overall supply chain."

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"As of right now, 3D printing is extensively used in the aircraft industry, but it has unbounded potential for its use in the future."

lighter and 5 times more durable than its predecessors. The success of the LEAP Jet nozzle has motivated GE to experiment with 3D printing on future endeavors to great success such as reducing a helicopter engine from 900 components to just 16 pieces (Kellner).

Boeing has also utilized 3D printing to generate a competitive advantage. When manufacturing its 787 Dreamliner, the company incurred almost \$29 billion dollars in losses before the Dreamliner even became profitable. One major reason for the significant losses was due to the acquisition of a necessary Titanium based part, a product stronger and lighter than Aluminium, but also 7 times as expensive. Norsk, a supplier for Boeing, managed to develop a special 3D printing method called Rapid Plasma Development (RPD) in which titanium wire was melted in argon gas to create these parts, saving money on the total raw material needed and processing costs. After beginning to utilize additive manufacturing, Boeing conducted a cost analysis study, which showed that they could save almost \$3 million in construction costs per Jet. To date, Boeing has printed out almost 20,000 parts using additive manufacturing, and the 787 dreamliner is composed of almost 30 3D printed parts (Vincent).

Despite the cost advantages of 3D printing, there are many avenues for improvement. First off, additive manufacturing can be enhanced so that printed parts are fully functional upon creation because currently many 3D-printed parts must go through additional processing before it can be used. 3D printers will also have further potential when they are able to mix materials together because most of today's 3D printers only work with a single material at a time. Lastly, the 3D printing industry only provides extremely expensive and high quality printers or cheap low quality printers (Curran). The expensive printers can only be justified for large-scale industrial operations, while the cheaper printers are not well equipped to handle large order volumes. There will need to be further developments in 3D printers for the quality and cost-effectiveness to be acceptable for standard mid-size manufacturing firms (Curran).

As of right now, 3D printing is extensively used in the aircraft industry, but it has unbounded potential for its use in the future. The savings from reduced labor costs will entice more companies and industries to incorporate 3D printing into their own manufacturing processes. It is also likely that if innovative processes continue to be developed, such as RPD, companies will be able to source less raw materials given their ability to create fewer, but more complex parts. The advent of 3D printing truly exemplifies the increased application of



technology to execute tasks in our business and its unbound potential in so many areas.

## **RUSCA EVENTS**



## General Interest Meetings start biweekly at 9:45pm at Livingston Campus - Tillett Hall 103A

#### **Events for December:**

12/11: Final General Interest Meeting for Fall 2017

Spring Semester Lookahead - RUSCA Committee Applications



11/9: General Members Meeting and tour of Lone Eagle Brewery

12/8: Webinar Series (2:00pm-3:00pm)

Managing Intellectual Property - Register here

12/15: Webinar Series (1:30pm-2:30pm\_

Leadership - Register here

1/10: Membership Meeting at Bridgewater Manor

1/11: Seminar: 1/2 Day Workshop at Daiichi Sankyo U.S. HQ

Supplier Relationship Management Fundamentals

Register here

To see more of ISM-NJ's past and upcoming events or become a member, visit ismnj.org.





#### **Rutgers University Supply Chain Association**



#### **RUSCA's Mission Statement:**

To inspire our RBS students into learning more about Supply Chain Management and its opportunities, as well as to serve as an intermedi- ary organization on behalf of the RBS student and support the student in the pursuit of a successful internship, co-op, or full-time offer, most especially for our Supply Chain majors.

Want to know more and stay up to date with RUSCA events?