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Topic: Discuss your vision of electronic design, engineering and manufacturing in the global economy.

As a Supply Chain Management undergraduate at Michigan State University, this year's topic on manufacturing and logistics is an exciting opportunity for me to share my initiatives and vision on technology integration in global supply chain. Recently, in the 2018 Third-Party Logistics (3PL) Study, Penske Logistics published its evaluation of a high value, basket of applications that includes blockchain, automation/digitization, and logistics talent revolution; describing them as the key to supply chain technology advancements. Agreeably, many companies are interested in exploring blockchain, with similar reasons to Ken Toombs, Global Head of Infosys Consulting, as he believes, "Blockchain has the potential to make significant improvements in security, transparency and governance, but only in supply chains where there is value in controlling consumer risk, valuable goods, or complying with regulations".ⁱ However, "the report...[continued, revealing several] reasons for lack of investment in digitization and automation, including a lack of in-house talent to develop, implement and monitor".ⁱⁱ In relations to high-tech companies, I can second the report's reasoning based on an assessment of my own internship experience at IBM and Pratt & Whitney. Technological skills are not evenly dispersed throughout any organization; departments outside of product engineering and R&D lag significantly in talent resources with technology skills or interest. As a result, major business functions such as accounting, finance, and supply chain are losing out on huge cost and process optimization benefits.

During my 6-month Co-op at Pratt & Whitney (PW), I tackled the responsibilities of a materials requirement planner (MRP), and challenged their traditional processes that required manual inputs/outputs of data in various SAP, an enterprise resource planning (ERP) system, transactions for planning, scheduling, and sourcing daily production. Each transaction was time consuming and repetitive—due to the single-view layout and limitation of SAP—, and error sensitive. Unwilling to conforming to traditional manual process, these inefficiencies led my proactive nature to develop an automation solution by linking SAP GUI scripting and Microsoft Visual Basics (VBA) in Excel tailor to various transactions in SAP. I succeeded in eliminating non-value-added steps in the process and human errors. My ≤ 2 -minute automated script is still

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actively used for MRP transactions and saved approximately 5 hours of daily task time; reduced processing time of on average 85-97% in a series of transactions. Technology-based solution and innovation should be implemented through continuous improvement and emphasized throughout the whole organization. Likewise, Neil Collins shared a powerful insight saying, ¹ “[As] the entire supply chain organization must now compete with technology, ...the winners will be those that elevate their people using technology, rather than replacing them with it”.ⁱⁱⁱ

Automation has already demonstrated high returns across the supply chain through digitalized load matching and warehouse robotics as mentioned in Penske Logistics’ 2018 3PL Study. Now it’s time to explore the disruptive technology that is said to be the new global trade digitization solution, blockchain, developed through the collaboration of IBM and Maersk.^{iv} During my internship at IBM, I had a rare opportunity to sit front row during a demo of blockchain and immediately saw the potential that IBMers are all raving about. I envision blockchain to be the next big thing that will increase connectivity in our global economy as global trade becomes more accessible for both emerging and developed countries.^v Blockchain technology was developed to aim at a “one-stop” solution for a wide range of issues relating to the cost and complexity of global trading. IBM described blockchain as, “an immutable, security rich and transparent shared network, provided each participant end-to-end visibility based on their level of permission”.^{vi} One of blockchain greatest attributes is the real time exchange of original supply chain events and documents, which IBM further explains, “[allows] detailed visibility of the container’s progress through the supply chain”.^{vii} Aside from increasing efficiency and productivity to the global supply chain, blockchain’s level of transparency will help, “reduce fraud and errors, reduce the time products spend in the transit and shipping process, improve inventory management and ultimately reduce waste and cost”.^{viii} Moreover, real time visibility, especially as a container advances through the supply chain, will help streamline customs and compliance by increasing efficiency in border inspections and clearance procedures. For shippers, IBM also highlighted benefits of a planned solution as it, “can help reduce trade documentation and processing cost [and] eliminate delays associated with errors in the physical movement of paperwork”.^{ix}

¹ PR Newswire’s interview on Neil Collins, Regional Managing Partner for Korn Ferry’s North American Industrial Markets.

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Overall, blockchain is promising major deliverables that will essentially disrupt and revolutionize global trade. It's a great example of how my vision of technology advancements in manufacturing and logistics exists in our global economy.

ⁱ "The 2018 Third-Party Logistics Study Highlights Potential of Blockchain and Digitization/Automation in Supply Chain." *PR Newswire*, September 26, 2017, p. 1-3. ABI/INFORM Collection, US Newsstream (1942610017).

ⁱⁱ *PR Newswire*, September 26, 2017, p. 1.

ⁱⁱⁱ *PR Newswire*, September 26, 2017, p. 2.

^{iv} "Maersk and IBM Unveil First Industry-Wide Cross-Border Supply Chain Solution on Blockchain." *PR Newswire*, March 5, 2017, p. 1-4. ABI/INFORM Collection, US Newsstream (1874165684).

^v *PR Newswire*, March 5, 2017, p. 2.

^{vi} *PR Newswire*, March 5, 2017, p. 2.

^{vii} *PR Newswire*, March 5, 2017, p. 2.

^{viii} *PR Newswire*, March 5, 2017, p. 2.

^{ix} *PR Newswire*, March 5, 2017, p. 3.