Artificial Intelligence in Procurement: How will it affect you?

On a daily basis, we see artificial intelligence (AI) impacting our lives, and its advancement is not slowing. It's already at work in iPhone's SIRI and Amazon's Alexa. It's just around the corner in self-driving cars (an area where my engineer son works) and in motorcycles.

AI powers search algorithms for Google, Alibaba, SAP's Leonardo, and IBM's Watson platform, which act in Sales (contextual marketing), Plant Management (automated defect detection), Supply Chain Optimization, and R&D (predictive diagnostics), as well as autonomous weapons. In Finance, 70% of all financial transactions today are performed by algorithms, a kind of artificial intelligence.

Major players like KPMG, Accenture, SAP, and IBM are betting that large enterprises will pursue cognitive procurement as the logical next step in their overall digital transformation.

I am not an AI specialist, nor do I have an IT background, but I've been collecting elaborate information on potential uses of AI in the Procurement arena. I am confident these can happen as soon as we solve some outstanding issues in our field. What follows is a historical review of AI, an examination of issues in procurement, and finally, a look to the future.

Background and Applications of AI
In the 1940s, the American mathematician Norbert Wiener (1894–1964) invented cybernetics. According to Wiener, the behavior of systems could be controlled by means of suitable feedback, but the necessary technology was not available in his time. That, however, has changed, and the technology is definitely here.

Following are several ideas for using AI technology in a business context:

• **Pattern recognition**: Understanding typical trends or behaviors for customer financial transactions and spotting anomalies in an account's spending data to identify potentially fraudulent behavior.

• **Prediction**: Capturing short- and long-term variability in data to improve forecasting of energy consumption or predicting future prices.

• **Classification**: Examining animal track images and grouping them by species type to support wildlife conservation efforts.

• **Image recognition**: Determining if nodes on a patient's raw CT scan are malignant or benign, or face recognition in iPhone X.

• **Speech to text**: Transcribing customer call center voice messages to text for detection of sentiment and further analysis.

• **Cognitive search**: Offering personalized recommendations to online shoppers by matching their interests with other customers who purchased similar items.

• **Natural language interaction (NLI)**: Telling a software application to generate a report on sales revenue (or procurement spend) predictions without making humans run the reports.

• **Natural language generation (NLG)**: Getting summaries of everything that has been analyzed from a large document collection.

This fine article about use of AI in business recently appeared in the *Harvard Business Review*: Robo-Advisers Are Coming to Consulting and Corporate Strategy.

Procurement Concerns with AI

According to the 2017 Deloitte Global CPO Survey, Procurement leaders reported these significant concerns:
- 49% - Quality of data
- 42% - Lack of data integration
- 29% - Skills/capabilities of analytics resources
- 29% - Current technology
- 26% - Limited understanding of data technology

So, massive hurdles due to legacy enterprise IT systems and data silos

The first two issues reported by Procurement leaders are the major hurdles to implementing AI in Procurement. I experienced precisely such challenges dealing with quality of data and data integration when I was responsible for implementing Spend Analytics at Dow Chemical Co. (now DowDupont). Based on this experience and exchanges with other large companies, I have learned that the bigger the company, the bigger the data issues Procurement officers will face.

Dow used to run SAP R2 with thousands of modifications, while simultaneously running SAP R3 from its Rohm & Hass acquisition, plus 12 legacy IT systems (mainly MRO). ERP systems (like SAP) force us to code any raw material (SKU) and packaging so the system can calculate the variable cost for income statements. Even with forced coding, we find the same raw material with different codes or different names, including trademarks, even when English was the only language used.

The nightmares begin when you go to MRO (maintenance, repair, and operation), Logistics (freight), and Services. This is where the system does not force a unique code, the language is not necessarily English, and systems are different. Another issue is the lack of discipline in supplier names and codes. There are dozens of different names for the same company, which could include different legal entities or even simple misspellings.

Dow solved the problem years later by replacing everything with a new SAP platform. The key to this change was the leadership from the VP of Purchasing (my boss) who had an IT background and understood the issues we were facing. She helped me define specific resources to create product codes, service codes, and supplier codes (parent-child relationships), so we could have the same, consistent data on a global basis.

Companies like DowDupont and others who have invested in quality data and data integration will be among those prepared for AI integration in Procurement.

Some Predictions

Deloitte's CPO Survey offered a succinct summary of the high impact outlook of transformations in these segments. It observed, "Source to Contract is becoming predictive, Purchase to Pay is becoming automated, Supplier Management is becoming proactive, and these are all empowered by analytics and strong operational management."

In an interesting article, Edmund Zagorin proposed the following ways that AI could rapidly transform enterprise Procurement organizations over the next five years:
- Cognitive systems replacing supply chain assistants
- Cognitive systems replacing purchase order systems

➢ Cognitive systems replacing supplier on-boarding workflows
➢ Cognitive systems forecasting prices, generating contract templates, and evaluating suppliers before a human does

I agree with the reasoning of these predictions but would add a cautionary note. The timing is ripe, but only for those companies that have solved issues of quality of data and data integration. A further caution is that these predictions are still at the operational level and are not yet strategic.

Next Digital Transformation

The biggest impact on Procurement remains yet to be elaborated. My vision of AI in this arena is related to strategic sourcing where AI will generate alerts, from thousands of sources, including our cleansed system, about what is happening in the market to help sourcing managers make decisions to benefit their specific business and the company as a whole.

For example, we know that Crude Oil, Coal, and Natural Gas costs affect prices of most of chemicals and plastics. We also know that Crude Oil affects freight costs, metals costs affect MRO, and labor costs affect services. We have seen that natural disasters, plant shutdowns, product recalls, and company bankruptcies have affected the supply chain. Finally, of course, the supply-demand balance affects what we all buy.

Once your company has done the necessary homework to internally fix the quality of data and data integration, AI will be able to map everything you buy, from any company and in any location, and then correlate them with cost drivers, supply chain network, supplier profiles, finance, and natural disaster news. That means AI can generate alerts (called Cognitive Insights) that can impact supply, demand, and/or prices, allowing **you** to decide what action you might take to protect your company against supply disruptions or to create savings opportunities.

Companies like ICIS, IHS, and ChemicalInfo (in the chemical space) as well as Beroe Market Intelligence have the Procurement knowledge capital to work in this space. What they will need to do to continue their advancement, however, is to join with AI firms to develop the next digital transformation.

Take-away

Without a doubt, artificial intelligence is coming and is poised to impact the Procurement world. It will immediately impact jobs on the operational side and then begin to affect strategic sourcing by improving awareness about what will impact strategic decision-making. Once the companies can fix the quality of data and data integration within the company, they will be well positioned to make this world-changing leap.

Taking Purchasing to the next level,

Paulo Moretti

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