

A Gartner survey, conducted in 2017, shows 37 percent of organizations have implemented AI in some form. According to Gartner, the number implementing AI grew by 270 percent in the past four years. (Gartner, January 21, 2019). Since 2017, supply Chain professionals have been emphasizing the need for Artificial Intelligence applications across the integrated supply chain. As well, Supply Chain executives believe the core of Artificial Intelligence is the ability to recognize patterns across the volume, velocity and variety of Big Data that will support better supply chain decision-making.

*ResearchandMarkets.com* on April 11, 2019<sup>1</sup> reported that the global AI in supply chain management will reach \$1.3 billion by 2024. “AI in supply chain management is enabling improved supply chain automation through the use of virtual assistants, which are used both internally (within a given enterprise) as well as between supply chain members (e.g., customer-supplier chains).”

It is clear from the above that we have accelerated the digital transformation to fully apply AI as the next driving technology. But, do we really have a full understanding of AI and the true ability of the technology?

## What is Artificial Intelligence?

Simply stated, AI is intelligence derived from machines with reasoning, making decisions and taking action. It simulates human intelligence traits such as problem-solving. AI can transform complex unstructured (and structured) data into predictive and prescriptive insights. The key elements of Artificial Intelligence include machine learning and cognitive computing.

Gartner defines it as a technology that “applies advanced analysis and logic-based techniques, including machine learning (ML), to interpret events, support and automate decisions, and taking actions”. Noha Tohamy of Gartner at the recent Gartner’s Supply Chain Executive Conference divides AI into two categories:<sup>2</sup>

- **Augmentation:** AI which assists humans with their day-to-day tasks, personally or commercially without having complete control of the output. Such Artificial Intelligence is used in Virtual Assistants, data analysis, software solutions; where they are mainly used to reduce errors due to human bias.
- **Automation:** AI which works completely autonomously in any field without the need for any human intervention. For example, robots performing key process steps in manufacturing plants

## Artificial Intelligence in Action:

When you investigate the application of AI in Supply Chain, it becomes clear that many of the applications fall into the “Augmentation” category.

A case in point is the implementation of AI by “GoodTimes” (Good Times Burgers & Frozen Custard of Denver) to take orders from customers. The partnership with a solution provider enabled the fast food restaurant to take orders faster. The results included average wait time to improve by 10% to 25%.<sup>2</sup>

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<sup>1</sup> Source: (DUBLIN, April 11, 2019/PRNewswire? – The “Artificial Intelligence (AI) in Supply Chain Management(SCM) Market: by Technology .....and Region 2019-2024)

<sup>2</sup> Source: Noha Tohamy, Gartner Supply Chain Executive Conference, 2018

One could imagine that, eventually, further enhancements can be made in this application to move closer to “Automation” category with deployment of robotics.

In another case, McDonalds has embraced AI through a partnership to develop technology that will customize the contents of drive-thru menus based upon customer orders and geofencing data. This unique approach will “... play in our future and the speed with which we’ll be able to implement our vision of creating more personalized experience for our customers” – McDonald’s CEO and President Steve Easterbrook.<sup>3</sup>

There are several other examples of applications of AI in the food service industry. These include:

- **Chatbots**
  - The use of virtual assistance to process customer orders. Dominos started using chat bots in 2017
- **Robots**
  - Some restaurants have implemented Robotics for the kitchen. The leading example is the partnership of the Cali Group with “Miso Robotics” to develop a robot to “grill and flip” burgers.

The significance of these examples is the application for which AI was implemented. In all cases, the implementation of AI was for processes that directly impact the Customer or the restaurant operations in order to deliver a better customer experience or reduce labor costs. There are numerous other cases where AI has been effectively implemented within the front end of the operations.

The question now becomes, how can supply chain build upon this experience to implement AI into the entire integrated end-to-end Supply Chain?

## Artificial Intelligence in the Integrated Supply Chain

The examples in the previous section clearly show the results of a successful implementation of AI. The challenge for supply chain professionals is to drive AI initiatives throughout the integrated supply chain.

There are four general areas where utilizing AI can make a major impact on your supply chain:

1. Streamline processes
2. Planning
3. Shaping the Market
4. Faster and more accurate delivery

### ***Takine a closer look:***

#### Streamlining Processes

The processes within the integrated supply chain are vast and complex. The power of AI can streamline the information from suppliers to customers from real-time data in order to determine supply plans and distribution optimization. The speed at which AI can extrapolate the data and recommend solutions will

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<sup>3</sup> IBID

directly produce significant savings to the enterprise through reduced inventory, reduced supplier costs and optimized distribution networks.

### Planning

The streamlined processes through AI will enable supply chain professionals to expand the use of AI in demand and supply planning. The benefit of AI in planning is the capability to analyze infinite amounts of data and create a demand and supply plan (schedule) in minimal time based upon continuously varying amounts of information. Obviously, this cannot be done effectively in the current state; but, with AI, the planning variability will be almost flat with close to zero errors.

### Shaping the Market

Within any market, evolving the product portfolio and optimizing delivery routes and modes are critical. In the food service industry, having a relevant menu is critical to the success of the restaurant. The McDonald's example demonstrated the use of AI to anticipate changing customer demand. The ability to capture real-time consumer behavior will enable the industry to shape demand through dynamic pricing, new menu items, and product designs that satisfy customers' behaviors and fast changing demands.

### Faster and more Accurate Delivery

The need for "speed" has dictated the time, speed and cost of delivery. The trend is for faster delivery at no cost to the customer. Discussions with CFO's across many industries verify that companies continue to experience increased delivery costs as a percentage of sales. Now, with the use of AI, an almost infinite amount of information can be analyzed to predict delivery patterns and optimized routes. The use of predictive analytics will enable the enterprise to more effectively manage the delivery pool; especially during peak hours.

The significance of these four areas is to understand that AI must be embedded across the entire supply chain. The AI implementations to date demonstrate significant progress in one or two of the four areas above. However, in order to capture the full positive impact of AI, it is important for the enterprise engage in AI initiatives in all four areas. By doing this, there will be significant benefits and savings in the overall supply chain.

In fact, an AI enabled integrated supply chain can realize increased revenue for the enterprise. Although the investments in AI can be large, the increase in revenue will certainly offset these costs. Yum Brands (owner of KFC, Pizza Hut and Taco Bell) has embraced AI in many parts of its supply chain and operations; especially in China. As a result, Yum Brand reports increased spending on each order by an average of 1%. This translates into hundreds of millions of dollars in extra revenue.<sup>4</sup>

### Looking Forward

This article lists some of the benefits of AI in the integrated supply chain. There is no doubt, as the examples have shown, there has been great success in implementing AI in various operational parts of the enterprise; especially in the front-end of the operations. As we discussed in this article, a lot can be gained by integrating AI throughout the enterprise.

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<sup>4</sup> Source: Bloomberg Business Week, KFC Aims to keep Its China Edge with AI Menu.... March 20, 2019

At an AI conference in June 2019, Dave Malenfant presented six ways that AI will change supply chain;

1. *Reduce operational costs, reduce inventory and respond to the customer quicker* through RPA and intelligent robotic sorting and picking
2. *More meaningful supply chain productivity KPIs* incorporating predictive and prescriptive KPIs
3. Improved supplier selection and increase effective of SRM through deeper analysis of supplier-related data and trends for better decisions
4. *Enhance customer experience* through customer facing “APPS” to analyze behavior
5. *Supply planning and scheduling accuracy* by embedding machine learning and AI into constraint analysis.
6. *Improving DPA (Demand Plan Accuracy)* by analyzing the “sheer” volumes of data from all sources whether structured or unstructured.

### Failure to Act:

Most companies have been reluctant to embrace AI as a supply chain strategy. Today, typical retail/CPG supply chains still carry 60-75 days of inventory. The average service level is about 96 percent with lower rates on promoted items. The casual dining segment still carries around 12-15 days of inventory with relatively high waste and high cost-of-goods sold.<sup>5</sup>

The limited success of implementing AI in the integrated supply chain can be attributed to:

- *ERP Systems* – not easily adaptable to AI
- *Not integrated* – node focus for AI
- *Organizational conflict* – IT versus Supply Chain as owners of AI initiatives
- *Stale or Bad Data* – efforts to clean data are lacking
- *Oversimplification of Demand Planning* – forecasting rather than demand signals
- *Will Replace all the People* – resistance to embrace AI out of “fear”

Looking forward, these are roadblocks that can and must be overcome.

### Conclusion

This article introduces some of the challenges and opportunities for Artificial Intelligence in the integrated supply chain. There is no doubt that AI is the leading disruptor facing all supply chain professionals today. As stated at the beginning, *“Supply Chain Executives believe the core of Artificial Intelligence is the ability to recognize patterns across the volume, velocity and variety of Big Data that will support better supply chain decision-making”*. This can only be achieved if we approach Artificial Intelligence differently as supply chain professionals.

Artificial intelligence brings you:

**Enhanced Transparency** - With the ability to collect large amount of data to give total transparency of every aspect of the supply chain and all products within the supply chain

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<sup>5</sup> Source: Various conversations and IBID

**Greater Scalability** – Virtually any amount of data (structured or unstructured), nodes and touchpoints can be gathered

**Better Analytics** – Opportunities to make quicker, more intelligent decisions with predictive and prescriptive suggestions

**Increased Innovation** – Opportunities to create new, specialized supply chains and products due to spontaneous and accurate information.

Now, it is up to you!



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