The Autonomous Supply Chain

Seven Steps to Get There

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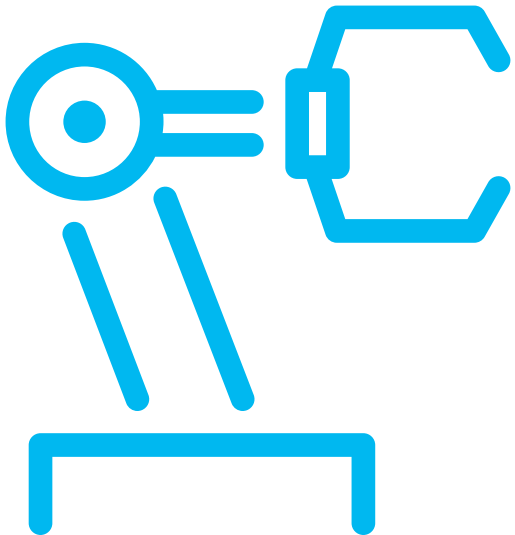
Artificial intelligence, machine learning and other advanced technologies are making it possible for the supply chain to become truly autonomous — able to predict disruptions and self-correct in real time. But how can the typical company achieve this ambitious vision?

Rapidly changing customer demand. Soaring expectations for service and responsiveness. Endless purchasing options. These and other trends are changing the way every company does business. Retailers, manufacturers and third-party logistics providers alike recognize that they must make radical transformations in their go-to-market models in order to achieve greater visibility, predict disruptions more accurately and respond with higher levels of agility — while also protecting their profit margins.

The old mantra of "cheaper, faster, better" lacks the sophistication needed to describe the complex challenges inherent in today's business world. Now and in the future, market leadership depends on making more strategic, more profitable, more automated business decisions in real time, every second of the day.

Clearly the business world is entering an age of contextual commerce, which means companies must do business in real time, in a cognitive and connected manner. They must understand and meet customer needs at a new level of

personalization, creating a transformative customer experience. The drive to automate the end-to-end supply chain is a critical capability to deliver on customer needs and achieve financial success in this real-time, digitally enabled environment.



Supply Chain Autonomy: The New Imperative

While most companies are implementing digital, smart, connected capabilities in their supply chains today, the truly autonomous supply chain, one that relies on artificial intelligence (AI) and machine learning (ML) to self-correct and make the right decisions automatically still seems out of reach. But this capability is rapidly becoming a competitive imperative. The companies that ultimately win will be those that can confidently answer the question "What's coming next?" and build self-learning supply chains that make profitable real-time decisions in response.

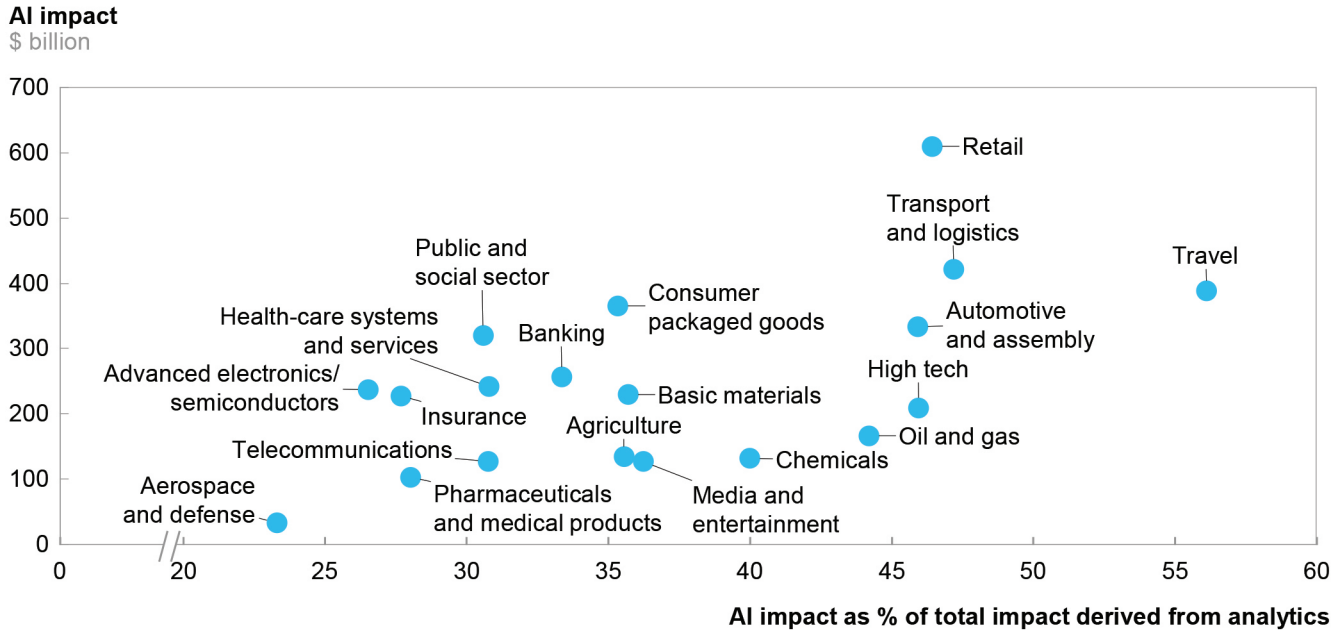
A recent paper from McKinsey projects that the AI capabilities that underlie autonomy will create $3.5 to $5.8 trillion in annual value in the global economy. As shown in Figure 1, McKinsey projects that AI will add significant value in every industry.

The paper also states, "For AI to realize a substantial portion of the potential value we have estimated will require companies to deploy these techniques comprehensively in areas where they can most effectively harness their ability to make the complexity of data an advantage."[1]

With its wealth of information about products, customers, manufacturing, transportation and logistics, and other key factors affecting sales and margins, the end-to-end supply chain is an obvious application for AI. Only by mining and applying this data in real time will organizations be able to successfully enact contextual commerce.

Figure 1: Potential impact of artificial intelligence across industries

AI has the potential to create annual value across sectors totaling $3.5 trillion to $5.8 trillion, or 40 percent of the overall potential impact from all analytics techniques



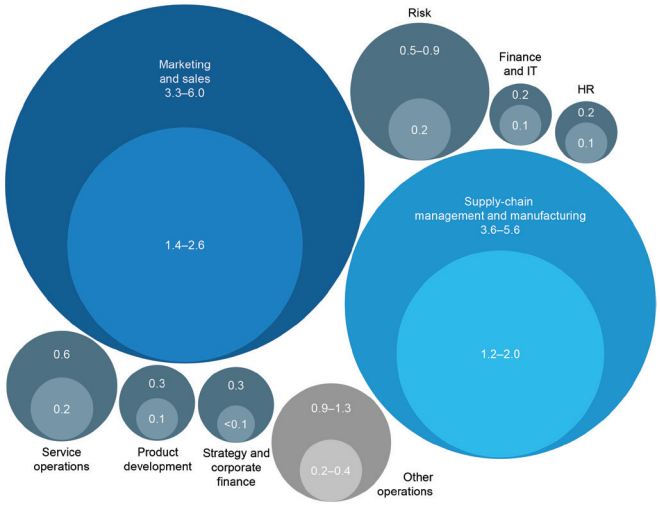
Source: McKinsey & Company: Notes from the AI frontier: Applications and value of deep learning by Michael Chui, James Manyika, Mehdi Miremadi, Nicolaus Henke, Rita Chung, Pieter Nel and Sankalp Malhotra, April 2018

Figure 2 shows McKinsey's projection that the application of AI in the supply chain is one of the single most important areas that generate future financial value.

Why is data so important? It can improve top-line financial results by supporting the fact-based development of products, pricing, assortments, promotions and personalized services that drive sales and satisfaction. Data also has the potential to drive bottom-line results by streamlining and automating workflows and decisions, identifying inefficiencies and controlling costs across the supply chain.

Equally important, by incorporating third-party data streams such as weather forecasts, social media signals and Internet of Things (IoT) signals, organizations can gain the critical capability to predict disruptions and take corrective actions that shape future demand.

Figure 2: Sources of value generation for artificial intelligence, by business function



Source: McKinsey & Company: Notes from the AI frontier: Applications and value of deep learning by Michael Chui, James Manyika, Mehdi Miremadi, Nicolaus Henke, Rita Chung, Pieter Nel and Sankalp Malhotra, April 2018

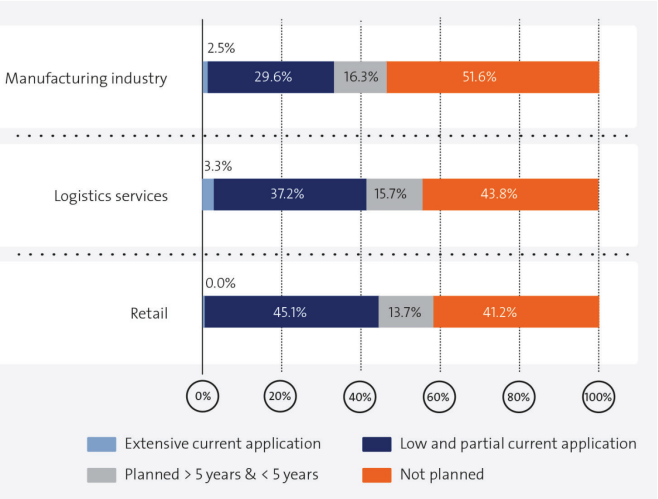
Challenges to Achieving Autonomy

To know what's next and to respond with immediacy and resolve requires companies to focus on the diverse digital capabilities required to support a truly autonomous supply chain. Building a supply chain that is designed to identify disruptions months in advance and prescribe the right actions before disruptions occur, is not easy. In addition to advanced technologies such as AI, it requires an entirely new strategic focus on supporting contextual commerce via visibility, agility and real- time responsiveness.

A recent report by the World Economic Forum emphasizes that a true transformation is needed — and points out that many companies are far from achieving this transformation: "More than 75% of supply chain executives claim they have limited, selective or even no information on their supply chains. To transform supply chains, a new level of supply chain visibility needs to be achieved. Fourth Industrial Revolution technologies, such as IoT and AI, will prepare the ground for the necessary transformation. New forms of structural and organizational agility need to be achieved."[2]

As shown in Figure 3, the required digital transformation is still not within reach of most manufacturers, retailers and logistics providers.

Figure 3: Adoption status of digital transformation by sector



Source: Impact of the Fourth Industrial Revolution on Supply Chains, World Economic Forum, October 2017

A Step-by-step Approach to Get There

While many businesses are struggling to digitally transform their supply chains via AI and other advanced technologies, the good news is that innovative companies are already proving it is possible. In partnering with these supply chain leaders and innovators, Blue Yonder has developed a list of seven key steps companies need to take in order to achieve the vision of the truly autonomous supply chain.

1 Achieve visibility of the end-to-end supply chain, across silos.

It only makes sense that an objective, end-to-end perspective on the supply chain is needed to support autonomous decision making — because an accurate decision depends on understanding all possible threats, opportunities and risks.

Only by seeing what is happening can intelligent supply chain solutions determine an appropriate response. This visibility must be complete and it must be objective — considering all signals, all internal conditions and all external drivers. Recognizing and understanding all opportunities across the supply chain is not only the first step towards achieving full autonomy, but it can deliver impressive financial results for most businesses.

For example, a global leader in the manufacturing of appliances needed a predictive end-to-end view of its global supply chain to improve customer service and manage channel volume volatility. Its supply chain is highly complex with over 2,500 component suppliers, factories and distribution centers across APAC, EMEA and North America. After its recent go-live, the company expects a 15% improvement in planner efficiency, 10% improvement in estimated time of arrival (ETA) accuracy for finished goods, and a 25% improvement in ETA accuracy for components. Retailers also see significant benefits: by increased visibility of how materials and finished goods flow through their end-to-end supply chains, Ace Hardware reduced inventory by $27 million[3] and Advance Auto slashed its cycle time by 50%.[4]

2 Gather and interpret data in real time.

Today's smart, connected supply chains generate enormous volumes of information about customer demand, costs, inventory levels, constraints, external conditions and other factors that impact end-to-end supply chain performance. This data reveals threats, opportunities and risks that enable the organization to respond strategically before performance is negatively impacted.

IoT solutions, predictive analytics and other capabilities help companies collect this data, interpret it, and apply it thus forming the foundation for supply chain autonomy. But real-time data collection and analysis also deliver significant standalone results. By leveraging advanced store technologies, retailers can achieve a real-time perspective on all their associates' tasks, organized by priority. One sporting goods chain realized a 7% increase in gross margin.[5] In addition, store associates' productivity improved significantly: Stock replenishment activities took place up to four times faster than before, while common check-in and put-away tasks got done more than twice as quickly.

3 Empower employees with AI capabilities to proactively mitigate risk.

A fair amount of media attention has focused on the fear that robotics, factory automation, machine learning and other advanced technologies will reduce the number of human workers across the supply chain. But, in fact, the increased presence of smart, connected supply chain technologies is transforming employees into strategic decision makers and increasing the value of their contributions. As technology solutions manage more tasks and a greater volume of analyses, employees are freed to focus on more strategic activities. For instance, a global leader in tire manufacturing based out of Europe looked to machine learning to ingest and learn from millions of data point correlations to proactively identify service level failures, with a high degree of confidence, in its supply chain before they occurred. The initiative was groundbreaking in that the new digital assistant provided the ability to pinpoint and prioritize service level issues two weeks before they actually occurred.[6]

4 Increase collaboration with suppliers and trading partners.

Just as autonomous technologies require the elimination of functional boundaries in order to deliver the greatest possible results, they also depend on seamless relationships and information sharing outside the organization. By leveraging common technology platforms and applications, companies and their many trading partners, including retailers and suppliers can enjoy real-time connectivity and an extended view of all the factors that could potentially impact the global supply chain. The concept of flowcasting is generating a great deal of excitement because it eliminates the barriers among retail trading partners and minimizes risk exposure. By sharing a single, continuously updated forecast, all partners can view mismatches between supply and demand and respond proactively in advance, instead of constantly responding to out-of-stocks and other emergencies that erode sales and profits. Trading partners can also minimize their large investments in buffer inventory and instead create more targeted inventories that reflect actual real-world demand. Companies with real-time visibility, collaboration and intelligent response capabilities can reduce their inventory investment by up to 10%, reduce expedited logistics expenses by up to 30%, and improve planner efficiency by up to 60%.

5 Reimagine standard workflows and processes.

The autonomous supply chain is a new way of doing business — and, as such, it demands that organizations rethink some of their foundational workflows and processes. New connectivity, new technology interfaces, new employee roles and accountabilities, and other big changes might be required to support ever-increasing levels of autonomy. As information volumes increase — and analysis is conducted in real-time — new approaches may be needed to store and process all this data. Most organizations will require elastic computing capabilities, such as those offered by private and public clouds, as well as software as a service infused with machine-learning algorithms.

It is critical to identify and partner with technology suppliers who share the commitment to supply chain autonomy. With online sales of 7.9 billion euros, the Otto Group is one of the world's largest online retail and distribution companies. The sheer scale and complexity of items that needed to be forecasted and ordered drove the company to embark on a transformation journey leveraging artificial intelligence and machine learning to surpass what humans could execute independently. The results have been impressive: Otto successfully predicts what is going to be sold within 30 days at 90% accuracy, executes the purchase of 200,000 items with zero human intervention, and reduced inventory by 20% while simultaneously reducing returns by over two million items.[7] Also, consider this example from Morrisons. The UK grocer invested in a cloud-based Demand Forecast & Replenishment solution, which uses AI technology to help autonomously improve demand planning and reinvigorate replenishment based on customer behavior in every store. In just 12 months, 26,000 SKUs across 130 categories (ambient and long-life replenishment across all 491 stores were optimized).[8] The result? Up to a 30% reduction in shelf gaps, a two to three day reduction in stockholding in-store, and a sales increase of 2.6% during a busy seasonal trading period.[9]

6 Begin to implement autonomous technologies in a strategic manner.

Achieving supply chain autonomy is not a sudden, all-or-nothing event — but a gradual adoption of value-added technology in the areas where it makes the most strategic sense. Organizations should begin to look at the information they collect and identify their most critical decisions, then establish a relationship between the data and decision making. By beginning to apply artificial intelligence and machine learning to their most vital activities such as forecasting and predictive inventory management to drive higher sales, companies can realize immediate, important benefits for a faster return on investment. Advanced technologies should always be leveraged with a specific purpose in mind and should drive bottom- line value. Amazon's predictive shopping forecast is the perfect example. Amazon's core selling proposition matches products and consumers quickly — so the internet giant calculates the expected demand of unique items for certain zip codes on specific dates.

Predicting supply and demand 20 days in advance enables Amazon to move products with efficiency and precision so they can ship rapidly, while costs and protecting margins are still controlled.

7 Remember that achieving full autonomy represents a journey.

While supply chain autonomy seems futuristic and out-of-reach to many companies, best- in-class businesses are making significant progress toward this goal. Whatever your company's current stage of maturity, it is essential to remember that achieving full autonomy is a journey, beginning with single technology implementations in critical areas of the business. Companies interested in exploring autonomy for the first time or increasing their level of automation and real-time decision making should partner with a supplier that offers a full range of capabilities across the end-to-end supply chain. Providers who can support all stages of the autonomous journey, from stand-alone solutions and cloud hosting through the most advanced machine learning capabilities — will be by your side until the journey is completed.

Want to learn more about how supply chain autonomy can impact your quality, service and financial results? With over 4,000 successful customers, Blue Yonder has the experience and capabilities to support you in leveraging the full power of automation.

There's a reason

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of Gartner's Top

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supply chain companies rely on Blue Yonder to set the stage for success in the 2020s.

Learn more at blueyonder.com

1 "Notes from the AI Frontier: Insights from Hundreds of Use Cases," discussion paper from the McKinsey Global Institute, April 2018.

2 "Impact of the Fourth Industrial Revolution on Supply Chains," World Economic Forum, October 2017.

3 Blue Yonder, blueyonder.com. (2014). Ace Hardware Transforms Its Supply Chain and Reduces Replenishment and Safety-Stock Inventory by $27 Million.

4 Blue Yonder, blueyonder.com. (2014). Advance Auto Parts Turns to Blue Yonder to Increase Product Availability — Leading to Both Revenue and Service Gains.

5 Blue Yonder, blueyonder.com. (2018). Boosting Revenue and Margins With Higher Productivity & Efficiency.

6 Blue Yonder FocusConnect 2018.

7 "How Germany's Otto uses artificial intelligence," The Economist, April 12, 2017.

8,9 Blue Yonder, blueyonder.com. (2018). Store Replenishment at Morrisons.

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