

Bringing intelligence and automation to digital supply chains

Automating work for higher value human-technology relationships—and results

On May 26, 2021, Chief Supply Chain Officers and executives met to discuss automation and the role of robotics in the supply chain. We were joined by Robert Playter, CEO, Boston Dynamics, who shared the work his organization is leading to build physical and digital environments that support automation in partnership with humans for improved outcomes.

The discussion underscored the importance of getting the process right first, building clear value cases, improving human experiences, driving closed-loop continuous improvement, and using artificial intelligence (AI) to drive touchless Intelligent Workflows.

Digital Supply Chain and Achieving Low Touch/No Touch Outcomes

The difficulty of defining digital supply chains emerged early in the discussion. For many, the goal of moving toward low or no touch environments that deliver speed and efficiency should shape the definition. For example, balancing the continuity of operations—operational effectiveness—in response to a surge in customer demand.

Digital supply chains should be streamlined and optimized, using secured data for seamless any-to-any and end-to-end frictionless connectivity. They can be built to scale with embedded intelligence to predict (e.g., preventative maintenance, inventory status, dynamic logistics). Digital decisions can support rapid identification, prioritization, and recommendations for next-best actions.

When the physical meets the digital, robotics (drones, robots), robotic process automation, and intelligent workflows can drive operational velocity with low or no touch operations in manufacturing, distribution, transportation, and field service asset maintenance. 79% of executives whose organizations are scaling intelligent automation expect their organization to outperform the competition in revenue growth within the next 3 years (Intelligent Automation IBV Study).

“We are a very efficient ‘brick and mortar’ supply chain that requires 5-6 touch times. We want to be a no touch, no paper supply chain. How do I integrate robotics into this supply chain to get to better data? No one has done this well—it is all manual intervention to get to different channels.”



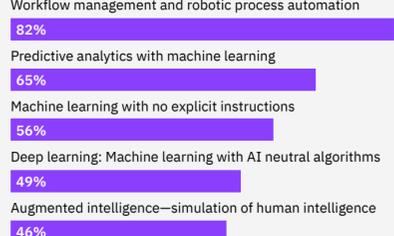
Building commercial models for automation at scale

Automation for many CSCOs is a given, but building a commercial model that demonstrates the value and upside of automation investments remains elusive. In many cases, hard dollar returns on automation investments are difficult to define, and because of process and project-based approaches, the ROI is often difficult to measure in meaningful terms.

In recent IBM IBV research, we learned that CSCOs are anticipating value beyond efficiency gains when they apply intelligent automation. The top expected benefit of automation: Improved customer experience. Following very closely were reduced operational costs and speed-to-response with data-driven insights. With an increased need to respond quickly to a fast-changing market, these second and third benefits will remain crucial. Improved reliability and reduced risks are important benefits that may have been undervalued in the past. But they will come to the forefront as companies address workforce dislocation, supply chain challenges, and customer service disruptions.

78% of executives agree that intelligent machines will evolve from performing just routine tasks and will render complex or even mission-critical decisions in the next 3 years (IBM IBV Intelligent Automation Study).

Implementation of intelligent automation technologies: from emerging to essential



“Ultimately, we need to connect physical machines and devices to the decision-making process. The next generation of robots will do work with humans and have the ability to do work by connecting the physical world to digital tools. This will unlock insights.”

“We’ve seen a move towards automation but also a challenge on where and how to invest. The challenge is the commercial model for the end market. Commercialization will come when we are able to turn data into information—data from the physical to inform decision making—then we will be able to scale to receive the market benefits.”

Integration of humans and robots is the future desired state

Thinkers agreed that the ultimate environment for success will bring automation and humans together in ways that deliver improvement to human work. But many felt this was a distant goal given the need for robots to have the ability to sense, comprehend, act, learn, and experience.

Unprecedented advances in sensor technology, computing power, and edge processing can provide robots with robust AI capabilities, but this is predicated on having secure, yet flexible, connectivity and interoperability. Robots must be able to connect readily to other robots, and also with a full range of IoT, edge, cloud, and analytical tools and other devices. Helpfully, AI algorithms have become more efficient, making it easier to program robots, devise innovative use cases, and reduce energy requirements.

“The ability for robots to do more than one thing will evolve and they will be able to sense and adjust and adapt. I know it is coming and we need that to get to the next stage of the supply chain.”

“We are experimenting with a model with robots and human beings, but until robots can sense, comprehend, act, learn, and experience, it will be difficult for us to build a fully integrated approach.”



Using AI to better define automation pathways and improve the automation journey

Some Thinkers pondered whether AI techniques could help identify the places where automation would have the most success. Improving visibility and transparency through the use of robots and increased data gathering was also an area of interest to the group.

Data-led innovation can occur at the base level of insights derived from a particular analysis of data—customer data, for example—that prompts the reshaping of a service proposition. It can be within the context of a workflow, where the continual monitoring and mining of the activities and performance within a process can highlight areas for improvement and prompt automated or human intervention. As AI is applied to these huge new universes of input, the potential for pattern recognition and workflow optimization becomes clearer.

But as data and information are the raw material of these new automated workflows, the value of that data is hugely dependent upon the transparency, trust, and security of the sources (enterprise internal, supply chain partner ecosystem, customer insights).

“We are using AI and translating it to shape the automation in an environment. We are letting the deep learning work on the data and tell us where it makes most sense to insert automation and/or robotics.”

“Can you use AI with robots to drive more intelligent track-and-trace and visibility by having robots that are able to pull data to help improve supply chain visibility? The more intelligence and sensory capability, the more you can start to make rules and understanding.”

“We are employing a lot of machine learning (ML). The work process and steps are improving as the ML gets smarter and improves over time. For example, we use gamification so the ML tool can come out with a better schedule based on inputs. We use gamification to get it to improve every time.”

Building the business case for automation and robotics requires a shift in focus to outcomes

Discussions also covered the barriers that challenge wider scaling and adoption of automation and robotics. The group was in agreement that to be successful, automation first needs to be shaped by desired outcome.

In addition to the advancement of robotics capabilities, other challenges reported by the research of global CSCOs included refinement of internal strategies with clear objectives and outcomes (43%); the need to re-engineer the misalignment of workflows to support automated decision-making (42%); and the increased complexity of IT architecture to implement & scale (42%).

The power of overcoming these misalignments may be in looking at workflows within the Enterprise and using them to straddle the historic process siloes. The more we extend the scope of a workflow and the more end-to-end the connectivity among the workflow’s customers and all contributing supply chain players, the greater the business outcomes may be. The combination of operational automation, renewable outputs, and human/machine interactions are being modelled by some industries to simulate and analyze digital automation as applied to the concrete world. They expect improved efficiencies and better business outcomes.

“Our processes in supply chain and logistics became too complicated. They were almost impossible to control. We had to look at the outcomes rather than the automation to determine where to go next.”

“Let’s challenge the process before we bring in automation. Let’s not automate a dumb process. Automation may not be the solution. What is the opportunity to unlock that will lead to the right decisions around automation?”

“Let’s start with a problem. New processes will also be created by technology, so this is the right starting point. Technology has to serve a purpose and we look at digitization through a lens that will help solve a problem.”

Master data development and the integrity of data are both foundational and critical to the success of automation

Data ownership and access is the fuel of the intelligent workflow. Sensing brings information from the edge, or from within the heart of the machines that make and deliver things, into the workflow for further automation, insight, and prediction. One of the biggest areas of value reinvention during the pandemic has been action on real-time demand and supply signals. This has required the supply chains of the world to balance flexibility and adaptability with resilience and risk management.

The massive explosion of data sources and micro-insights born from extreme digitization provides the opportunity to decompose complex problems and find solutions.

“The underlying data has to be kept up to date. There is a lot of foundational data that has to be strong. We had to start with foundational data and put governance around it before we could proceed.”

“Master data development and integrity of data are foundational challenges and are required to really get to the outcomes you need. Data is core alongside people and change management.”

Extreme automation, digitization, algorithms becoming the norm, and people being fragmented into more remote work environments all create the risk that humanity will come under increasing pressure. As the human-machine partnership increases, with humans and machines working together in tandem, the workforce will need to be reskilled to perform higher-value tasks, such as analytics and workflow monitoring. Also, following the recent pandemic, new definitions of workforce experiences have emerged, and with them, the need to keep customers, employees, and citizens safe and healthy, while accelerating progress in new ways of working. Leadership will need to embrace and proactively tackle these challenges.



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