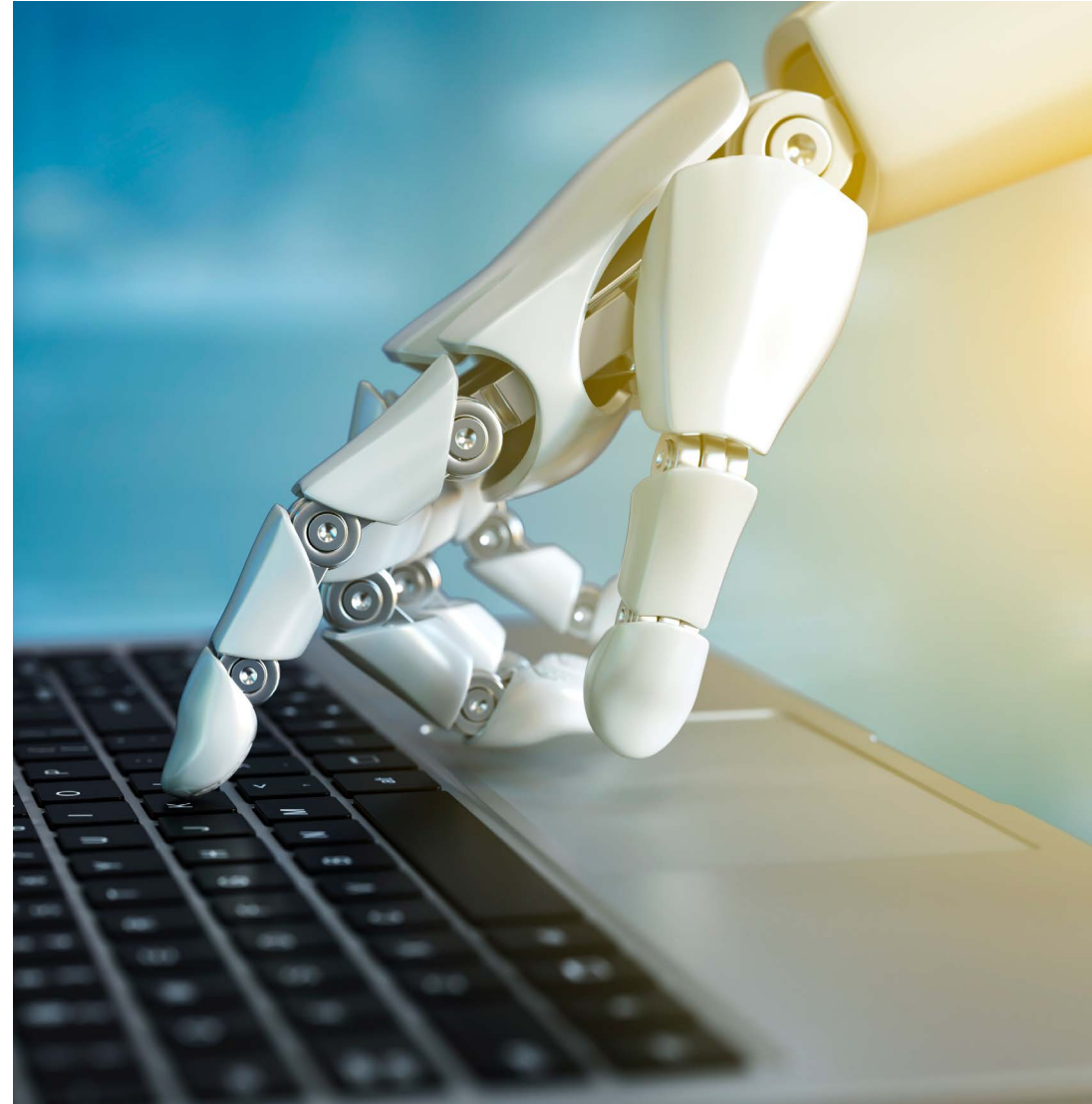
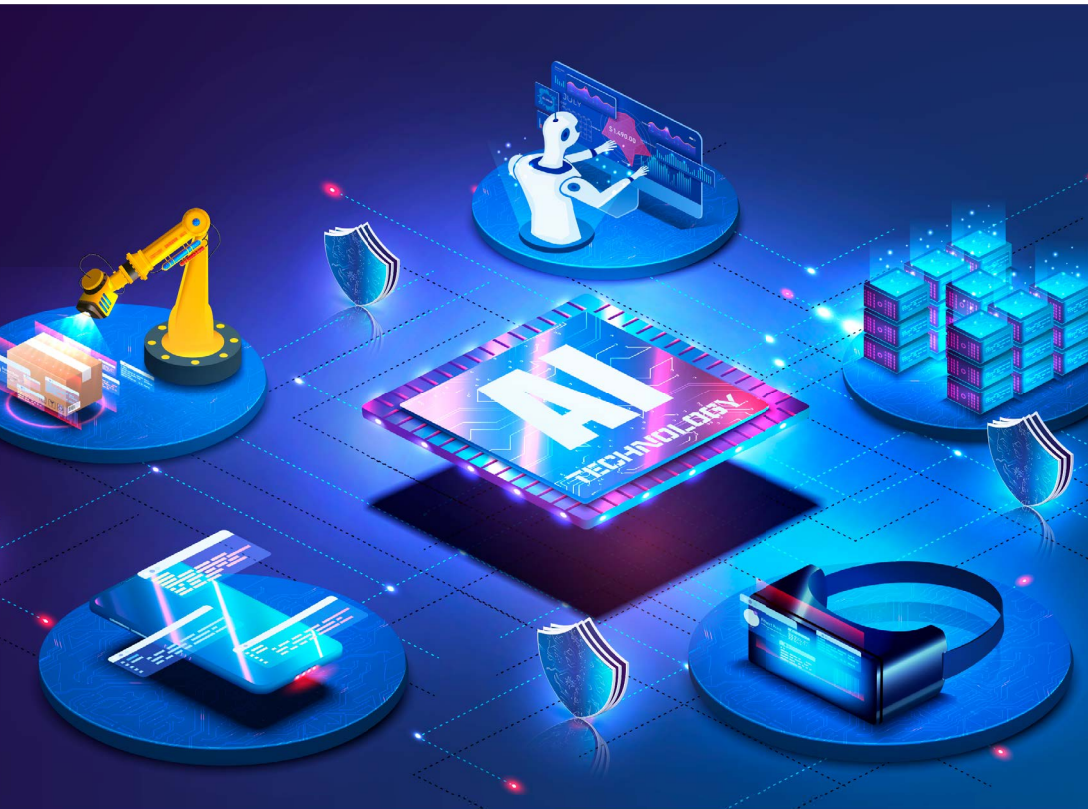


**How ARTIFICIAL INTELLIGENCE
AND MACHINE LEARNING
CAN OPTIMIZE THE SUPPLY CHAIN**

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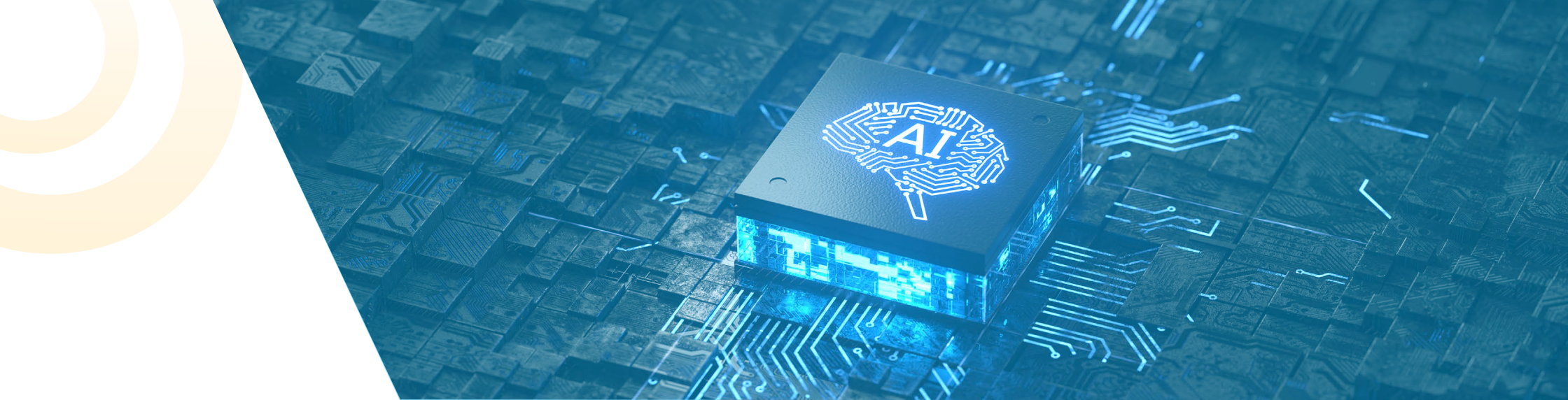


Introduction

Artificial intelligence (AI) and machine learning (ML) were already buzzwords in the technology and manufacturing spheres before the pandemic upended the global supply chain. Ironically, with the ensuing disruption from the health crisis, the push toward translating them into reality has become stronger.

Although there is still a huge gap between “ambition and execution,” as industry analysts put it, the AI and ML promises of higher productivity and better resilience cannot be ignored. A few have started adopting the technologies and many more are expected to follow and reap the benefits of a highly integrated system in the coming years.

To keep buyers and suppliers around the world up-to-date with the latest trends, Global Sources has put together books to provide insights on what’s to come in the era of automation.



About this Book

How Artificial Intelligence & Machine Learning Can Optimize the Supply Chain explores the potential benefit of technology on key areas, such as data collection and analysis, supply chain optimization, cost reduction, forecasting and planning. It offers a roadmap to augmentation and automation, and how this will help speed up operations, boost efficiency and build resilience. The book also covers challenges posed by the adoption of artificial intelligence and machine learning in current setups, and how they can be overcome.



How Artificial Intelligence & Machine Learning Can Optimize the Supply Chain

Artificial intelligence will remain a key strategic supply chain technology trend in 2021 and beyond, reinforcing earlier projections as the pandemic underscores the greater need for automation. Based on a survey of supply chain leaders conducted in late 2017 and reported by Gartner in 2018, AI is employed as

an advanced analytic technique to “either augment or automate human decision making” and increase productivity among human employees.

“AI in supply chain consists of technologies that seek to emulate human performance and knowledge, such as improving order delivery and service levels by using AI capabilities to determine the routes a company should take to optimize deliveries, or optimizing shipping replacement parts by applying AI algorithms and notifying users of a potential equipment failure prior to it occurring,” said Gartner VP analyst Christian Titze on the Top 8 Supply Chain Technology Trends for 2019.

Business users have become more interested in action and results over interpretation of reports, dashboards and data visualization. Data analysis through AI or machine learning can be modified and used to deliver recommended steps to automate processes that will lead to desired outcomes. Hence, there is an emergence of machine learning and AI-powered prescriptive applications among businesses.

Take an inquiry for example: Instead of entering one query and retrieving one result at a time, through machine learning there will be a responsive exchange of ideas, narrowing down and exploring from one single data point or inquiry.

Artificial intelligence is gaining momentum in supply chain management through machine learning, a narrow form of AI.



Artificial intelligence

Although AI is defined as a program or machine, which can perform a task carried out by a human who uses intelligence to accomplish such task, it is not merely about building machines that are smart. It is a branch of computer science aimed at replicating or simulating human intelligence in computer.

Stuart Russell and Peter Norvig, who co-wrote the book *Artificial Intelligence: A Modern Approach*, describe AI as the “study of agents that receive precepts from the environment and perform actions.” They explored AI based on four different approaches, which historically defined AI as thinking humanly, thinking rationally, acting humanly and acting rationally.

Further, AI is composed of “algorithms enabled by constraints, exposed by representations that support models targeted at loops that tie thinking, perception and action together,” according to MIT professor Patrick Winston. As a branch of computer science, it provides a blueprint for infusing machines and programs with machine learning and other subsets of AI.

Wide-ranging possibilities have been made possible with AI. In fact, AI continues to thrive as experts have predicted. Smart systems offer opportunities for people to enjoy a more customized future and not just personally but also in their work or businesses.

There are two types of AI – narrow and general.

Narrow AI is the weaker version as its operation is usually limited to performing a single task. This type of AI is recognized for its



benefits in the society such as Google search, personal assistants like Alexa and Siri, image recognition and self-driving vehicles.

Also known as Artificial General Intelligence, general AI applies intelligence to solve any problem. It can carry out tasks based on accumulated data or experience. This is the type that dominates the popular imagination, commonly shown in movies such as *The Terminator* or *Star Trek*.

Machine learning

Machine learning, another form of narrow AI, uses computer data, such as numbers, words, images, clicks and statistical techniques, to learn how to progressively perform a task better without programming, eliminating the need for the written code.

Machine learning has smart capabilities in analysis, data prep, discovery, prediction as well as in AI-powered prescriptive applications. This narrow AI can be employed in the supply chain for functions, including data analysis, supply chain optimization, cost reduction, forecasting and planning.

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Benefits & challenges in supply chain management

Supply chain management is the centralized process of turning raw materials into final products, and delivering them to consumers. It is a network or a system where data collection is a tedious but important process.

There is demand in the information gathered from the supply chain as this helps in forecasting and identifying the high and low points in a business.



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With machine learning, enterprises can gather and analyze data to help manage the sourcing and manufacture of goods.

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One of the benefits of machine learning is that businesses can enhance management and optimize speed in the supply chain.

With the data available, performance can be benchmarked, potential challenges identified and suggestions on how to speed up the supply chain made.

Another advantage is the timely forecast of demand from customers. With machine learning, enterprises can gather and analyze data to help manage the sourcing and manufacture of goods. It can also help identify seasonal and trendy products as well as those reaching their expiration.

Forecasting helps in inventory management to avoid overstocking or running out of stock. As a result, storage costs can be reduced.

In addition, businesses with machine learning can plan the movement of products based on the supply of goods and customer requirements.

Managing suppliers and documentation are the challenging parts of supply chain management. Machine learning can analyze the types of documentation, such as contracts and other forms from suppliers, then use this information as a basis for future agreements and administrations.

Automating inspections and auditing processes can be done with machine learning. Followed by a real-time analysis, this can detect anomalies or deviation from normal patterns, reducing the risk of fraud.

Lastly, businesses can ensure quality from their suppliers, products and assets by monitoring the quality of their raw materials and products and over time, suggest improvements.

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Ensuring quality, reducing costs and mitigating risks are among the advantages of an AI-powered global supply chain. However, there are still challenges when using machine learning in optimizing supply chains.

To achieve timely and accurate results, reliable, high-quality and timely information is a priority when using machine learning in supply chain management. All organizations in the supply chain must also provide data in a consistent way.

Systems between the supplier and manufacturer should be integrated, if possible, to automatically collect and process data. In addition, this information must be checked and audited every so often to ensure quality.

Ultimately, it is important to check and test the machine learning system and make sure that the results and suggestions derived from this are aligned with business needs and expectations.

Next Steps

So if AI is the key to the next big leap in improving your supply chain, how do you get started on implementing the technology in your business?

Identify the problems you want AI to solve

“To get started with AI, begin by setting aside the technology. Ask yourself what problems your business needs to solve, the challenges that need to be overcome and why this is important.” – Kasia Borowska, *Forbes* magazine

Establish concrete goals that add value for your business

“To prioritize, look at the dimensions of potential and feasibility and put them into a 2x2 matrix. This should help you prioritize based on near-term visibility and know what the financial value is for the company.” – Luke Tang, General Manager of TechCode’s Global AI+ Accelerator program

Know what your organization has the capability to achieve

“There’s a stark difference between what you want to accomplish and what you have the organizational ability to actually achieve within a given time frame ... a business should know what it’s capable of and what it’s not from a tech and business process perspective before launching into a full-blown AI implementation.” – Rob Marvin & Brian T. Horowitz, *PC Magazine*



Bring in experts, run a pilot project

“You don’t need a lot of time for a first project; usually for a pilot project, two to three months is a good range. You want to bring internal and external people together in a small team, maybe four to five people, and that tighter time frame will keep the team focused on straightforward goals.” – Luke Tang

Start small

“Start simple, use AI incrementally to prove value, collect feedback, and then expand accordingly.” – Aaron Brauser, Vice President of Solutions Management, M*Modal

Build a balanced system

“Too often, AI systems are designed around specific aspects of how the team envisions achieving its research goals, without understanding the requirements and limitations of the hardware and software that would support the research.” – Philip Pokorny, Chief Technical Officer, Penguin Computing

About Global Sources

Global Sources is a trusted, internationally recognized B2B sourcing platform that has been driving global trade for more than 50 years. The company connects authentic buyers and verified suppliers worldwide with tailored solutions and trusted market intelligence through trade shows, digital platforms and magazines.



Vision

To be the most trusted, customer-centric, multi-channel B2B trade platform that promotes authentic global trade geared towards enhancing the quality of human lives

Mission

Connect authentic buyers and suppliers worldwide with tailored sourcing solutions and actionable market intelligence. Help them meet the rapidly changing dynamics of the global trade, source more effectively and seize new opportunities

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