Infographic: Artificial Intelligence Use-Case Prism for Supply Chain

Published 16 March 2021 - ID G00740046 - 5 min read

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Initiatives: Supply Chain Head of Strategy Realization; Artificial Intelligence

This infographic identifies top 21 AI use cases in and across supply chain functions (source, make, plan, deliver and customer service). Supply chain leaders responsible for analytics and AI strategies can use this research as a starting point for prioritizing AI use cases to pursue.

More on This Topic

This is part of an in-depth collection of research. See the collection:

- Applying AI in Business Domains

Figure 1: AI Use-Case Prism for Supply Chain

In the above infographic, we explore the following use cases, grouped by functional area:

Customer Service

- **Customer Journey Analytics:** Customer journey analytics is the process of tracking and analyzing how customers interact with an organization over time. Its goal is to help organizations deliver optimal customer experiences, across touchpoints, by providing cross-functional teams with the 360-degree insights needed to execute it.
- **Digital Repair:** AI-enabled expert triage capabilities that reduce human intervention in the repair process by exploiting repair insights to drive improved product design, tools and processes aimed at preventing fault and/or simplifying resolutions for customers.

- **Virtual Customer Assistant (VCA):** Natural language understanding and/or generation enable VCA deployment in customer-facing roles. From simple informational exchanges for where is my order (WISMO) questions to transactions reliant on integration with ERP and/or WMS to change order quantity or delivery point.
- **Voice of the Customer (VoC) Tools:** A comprehensive VoC solution integrates feedback collection, analysis, distribution and action into a single interconnected platform, to help you understand and improve customer experience (CX). Feedback sources expand beyond direct surveying to include other, more indirect and inferred feedback sources.

Cross-Functional

- **Data Cleansing:** Supply chain visibility as the foundation for better (smarter and faster) and aligned decision making is heavily reliant upon data from multiple sources and partners in the business ecosystem. However, the data captured is often inaccurate and incomplete where AI can help improve accuracy and completeness.
- **Digital Supply Chain Twin:** A high-fidelity, digital representation of the physical supply chain that incorporates the relevant behaviors of the physical world. The digital supply chain twin is used to support decision making across, and through, the supply chain.
- **End-to-End Risk Management**: It combines strategic design of products and network with tactical flow optimization flow and operational mitigation of and response to disruptions. It is strengthened by AI-driven technology used for risk identification and monitoring, holistic risk impact analysis and coordinated operational mitigation/response.

Manufacturing

- **Asset Performance:** Applying machine learning (ML) and advanced analytics to detect patterns and predict equipment failure, lessening unplanned downtime, equipment operating costs, and boosting worker productivity. Improvements in reliability can, over time, be integrated with, or complement, production planning and scheduling.

- **Connected Worker:** Incorporates the usage of natural language processing (NLP), cognitive assistants, and advanced analytics to enhance how factory workers perceive, interact and control the physical and digital world around them. Requires a substantial capture and ongoing curation of knowledge, and a focus on ethics to eliminate bias.
- **In-Line Quality:** Using vision systems, deep learning, ML, and robotics to monitor parameters during inspection and in-process quality checks. This reduces inspection time and unplanned events. Requires integration of many technologies, and patience and trust with model creation.
- **Lights-Out Production:** Production processes that operate with minimal to zero human intervention. Leverages AI, ML, and autonomous things to increasingly automate and augment existing physical-based automation with new virtual processes and control logic.
- **Smart Factory:** Describes how the convergence of standard work with modern technologies to create a hyperflexible and self-adapting manufacturing capability. Blends multiple analytics, AI, ML, and automation capabilities that improve factory reliability and delivery.

Sourcing

- **Sourcing Analytics:** AI and ML tools surface key insights from internal and external market data in real time and provide contextualized recommendations across the source-to-pay process to support decision making. Examples include pricing visibility, supplier cost structures and future commodity trends.
- **Supplier Discovery:** ML algorithms that enable procurement organizations to rapidly identify alternative qualified suppliers, beyond the traditional supply base. Specialized solutions will also automatically recommend the most appropriate suppliers for a given requirement or specification.
- **Supplier Risk Management:** AI enables organizations to identify potential supply disruptions and anticipate production delays. An example is algorithms that analyze historical supplier performance data on delivery, quality and financial health to predict which firms and locations pose the highest risk of future problems.

Planning

- **Demand Sensing:** Using data and predictive analytics to create a more accurate short-term granular demand forecast to support improved customer service and inventory location and allocation decisions.
- **Intelligent Operations Center:** An intelligent operation center, sometimes referred to as a control tower, allows automatically identifying risks, handling exception management, performing root cause and impact analysis, and generating instructions and/or recommendations for supply operation and performance management.
- **Inventory Optimization:** An analytic approach to better identify, and set inventory targets and levels throughout all inventory locations and types in a supply chain.

Warehousing

- **Mobile Robot Control:** Managing a fleet of robots requires intelligence that looks at the work the robots need to perform, the location of robots individually and in relation to each other, and coordinates the movements (e.g., swarm technology) of the fleet.
- **Robotic Picking Systems Control:** These solutions use powerful vision recognition (e.g., 3D cameras) with advanced pattern recognition AI to allow robotic arms to move in a space, and identify and pick up items in various orientations, shapes, sizes and weights, and place these in the appropriate spots.
- **Warehouse Resource Planning and Optimization:** These systems are highly sophisticated, dynamic, traffic management systems that process a continuously evolving pool of work, considering variations in constraints over time and to dynamically plan and reprioritize work. Critical in high-volume, high-velocity warehouse environments, where traditional solutions to planning work are insufficient.

About This Research

Supply chain leaders responsible for the execution of their organization's AI strategy look for guidance in choosing AI use cases that balance the potential business value with feasibility and readiness. This infographic offers a collection of AI use cases that span different supply chain functional areas. Gartner analysts have scored each use case on a scale of business value and feasibility, based on both empirical evidence from working with clients and industry experience. Use this infographic as a starting point for investigating the top use cases that align with your overall digital strategy and supply chain priorities together with data, technology and talent availability.

Please note: These use cases have been selected and positioned based on an assessment by Gartner analysts and customer feedback. Their applicability may vary across organizations and industries. For detailed customization, clients can use Gartner's use-case prism toolkit (see Toolkit: How to Rank and Prioritize Your Use Cases With a Gartner Prism).

Recommended by the Authors

Uncovering Artificial Intelligence Business Opportunities in Over 20 Industries and Business Domains

Toolkit: How to Rank and Prioritize Your Use Cases With a Gartner Prism