Infographic: AI Use-Case Prism for Transportation

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Initiatives: Supply Chain Technology Strategy and Selection; Artificial Intelligence

Artificial intelligence is reshaping transportation. This infographic identifies 18 of the most prominent AI use cases that can improve transportation operations. Supply chain technology leaders responsible for transportation can use this as a starting point for further fine-tuning.

More on This Topic

This is part of 2 in-depth collections of research. See the collections:

- Applying AI in Industries
- Applying AI in Business Domains

Figure 1: AI Use-Case Prism for Transportation

Source: Gartner (optional)

The above infographic highlights the following use cases for transportation, grouped by functional area:

Fleet Management:

- **Asset Performance** — Applying machine learning (ML) and advanced analytics to detect patterns and predict transportation equipment failure, lessen unplanned downtime, equipment operating costs and boost driver productivity. Improvements in reliability can, over time, be integrated with/or complement transportation planning/maintenance.
- **Autonomous Trucks** — Autonomous trucks are commercial trucks that use a combination of lidar, radar, sensors and cameras as well as AI and ML to drive autonomously, meaning without the assistance of a driver.

- **Digital Transportation Twin** — A high-fidelity digital representation of the physical transportation resource that incorporates the relevant behaviors of the physical world. The digital transportation twin is used to support decision making across, and through, the transportation process mainly used for fleets.
- **Driver Hiring and Retention** — Driver hiring and retention uses advanced analytics to enhance recruiting and retention by improving driver safety. Predictive modeling technology uses artificial intelligence (AI) to analyze all available data across thousands of data points to build a true picture of a driver's behavior and provides the opportunity for remediation.
- **Platooning** — AI can provide more efficient ways of running trucking assets. Platforms like those from Peloton Technology can support truck platooning, which optimizes fuel consumption and can reduce the need for driver interaction.
- **Theft Detection** — Leverages AI to identify anomalies and threats in anticipation of and to prevent theft of an asset or cargo.
- **Transportation Risk Management** — Risk management uses AI to prevent accidents with commercial vehicles by analyzing drivers' historic behavior and real-time actions while driving, and also scanning the surrounding environment for potential threats.

Transportation Planning:

- **Digital Freight Matching** — Digital freight matching platforms use AI and ML to analyze the data it collects from various sources to provide better insights into available capacity. It uses intelligence to match the need for transportation capacity on the shipper side to available capacity on the supplier side.
- **Dynamic Appointment Management** — Uses smart appointment scheduling based on dynamic, in-transit ETAs, which facilitates better communication and collaboration between shippers, carriers, third-party logistics (3PLs) and facilities.
- **Real-Time Transportation Rating** — Real-time transportation rating for shippers refers to the ability to get transportation pricing in real time across different modes of transportation, leveraging historic and current rates while applying AI to predict capacity and future rates.
- **Time Slot Scheduling** — Leverages AI to create an intelligent and predictive scheduling process to support shipper delivery scheduling and improve customer experience.

- **Transportation Optimization —** Leveraging AI to more intelligently optimize transportation by using real-time data as input into dynamic and multidimensional algorithms rather than using static algorithmic optimization.

Transportation Execution:

- **Chatbots —** Chatbots use chat, messaging and other natural language interfaces to interact with shippers, carriers, truck drivers and customers around the status of the shipment. A key aspect is the enablement of the user to converse in their platform of choice — whether that is a messaging platform, SMS, virtual personal assistant (VPA), social or voice.
- **Delivery Drones —** Light cargo delivery drones are flying autonomous vehicles used to deliver small packages of food, medical supplies or other suitably sized goods. AI can help drones perceive their surroundings, enabling them to map areas, track objects and provide analytical feedback in real time.
- **Process Optimization and Automation —** AI continues to carry a great opportunity to automate and digitize transportation processes. Initiatives include the ability to apply AI in transportation to enhance decision making, such as automated route adjustments.
- **Urban Delivery Robots —** Autonomous deliveries offer a personless interface for consumers, while reducing costs and increasing flexibility. Robot companies have used the COVID-19 pandemic as an opportunity to gain operational licenses, providing an opportunity for technology and service providers to accelerate adoption.

Real-Time Visibility

- **Predictive ETA —** Using AI, real-time visibility is able to offer predictive ETA calculations for deliveries. Often the ETAs incorporate historical data, current traffic and even weather data that could impact a specific route or shipment.

About This Research

Supply chain leaders in transportation, 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 artificial intelligence use cases that span different transportation 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 transformation strategy and transportation 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).

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