



# **The impact of AI in supply chain solutions**

Empowering business for the  
future

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## Abstract

AI is the science and engineering of making intelligent machines. In recent years, it is revolutionizing the field of supply chain management, offering unprecedented opportunities for businesses to optimize their operations, enhance decision-making processes, and drive efficiency. The goal is “to turn data into information, information into knowledge and insight, and knowledge into competitive advantage”. This white paper explores the transformative impact of AI in supply chain solutions, highlighting its key benefits and practical applications.

### 1. Introduction

The integration of AI technologies, such as machine learning, natural language processing, and predictive analytics, has emerged as a game-changer in supply chain solutions. Four things have changed in the last years that are fuelling the adoption of AI: data availability, faster yet cheaper hardware, open-source frameworks, and ready-to-use AI tools specifically developed to solve business problems. These intelligent systems have the potential to transform traditional supply chain practices and create a competitive edge for businesses. By applying AI and advanced analytics to data, it becomes apparent that companies can unlock efficiency gains of up to 20 percent as well as boost sales and profitability. As a matter of facts, AI brings numerous benefits to supply chain management, including enhanced demand forecasting accuracy, optimized inventory management, improved logistics and transportation planning, real-time visibility, and proactive risk management. These advantages enable organizations to streamline their operations, reduce costs, and deliver superior customer experiences.

### 2. The Role of AI in Supply Chain Solutions

The use of AI in supply chain management enables companies to address new requirements from customers as well as the challenges raised by global megatrends. For example, the increasing products and parts variance makes forecasting demands and planning production much more complex. AI-powered algorithms analyse vast amounts of historical data, market trends, and external factors to generate accurate demand forecasts. By leveraging advanced predictive capabilities, businesses can make informed decisions, optimize inventory levels, and minimize stockouts and overstock situations.

Another example is the rising sustainability awareness, which requires taking further data sources and target variables into account when performing optimizations. AI-driven inventory optimization

techniques help businesses strike the right balance between stock availability and all kind of cost, environmental included. By considering factors like lead times, demand variability, and supplier performance, AI algorithms can recommend optimal reorder points, safety stock levels, and replenishment strategies. This also applies to logistics and transportation processes like route optimization, load balancing, carrier selection, and delivery time estimation, resulting in cost savings, faster order fulfilment, and improved customer satisfaction.

In addition, changes in demographics lead to reduced labour availability, requiring far higher wages and more attractive job profiles. At the heart of all supply chain processes, supply chain managers are required to make decisions. AI-powered systems can proactively identify and mitigate supply chain risks by analysing historical data, external events, and market indicators. This helps anticipate disruptions, implement contingency plans, and ensure business continuity in the face of unexpected events.

To understand where AI can support and augment supply chain processes, it is important to understand their underlying decisions. Within the vision three decision levels are distinguished: strategy, planning, and operations.

- Strategic decisions are made at a corporate level, where a single decision can have a very high impact with a competitive advantage. Examples are designing the integrated end to end SC, developing integrated SC performance measurement mechanism or developing a customer centric organization and governance.
- Planning processes translate strategy into action. Decisions are here related to make or buy, sales and operations planning, or inventory planning.
- The operation level deals with the actual management of the day-to-day flow of physical material and information. This level is also a sweet spot for the AI, being decisions taken very frequently, and often without a strong decision-making process at the base.

### 3. Driving AI Adoption in Supply Chain Solutions

The vast majority of SC managers understand the transformative power of AI. They however face a lot of challenges in implementing the technology. The impact of the transformation is in fact particularly significant, and the technology itself, being quite new to the scene, requires high level of expertise complex to find in the market. Our approach is based on the following steps:

- **AI Readiness Assessment:** We conduct comprehensive AI readiness assessments to evaluate an organization's technical capabilities, data infrastructure, and workforce readiness for AI adoption. This assessment helps identify any gaps or areas requiring improvement, ensuring a smooth transition towards AI-powered supply chain solutions.
- **Use case identification:** Use cases are ideated based on a target picture and KPIs. A process model of the supply chain is used to identify use cases. Ideas are generated without limitations and then rated using a matrix considering ease of implementation and business impact. The ease of implementation depends on technology complexity, expertise, and data availability. The business impact is evaluated using a cost lever approach, breaking down costs and estimating savings based on previous projects.
- **Action planning:** The prioritization of use cases focuses on selecting the most promising AI use cases without excessive detail. Before testing and implementing the use cases, a closer examination is necessary, including creating comprehensive business cases. Collaborating with domain experts, drafting the concept becomes crucial. A more detailed analysis of implementation feasibility and quantified business impact helps identify the most promising use cases.

- **Implementation:** Once the implementation roadmap is established, the rollout begins with a pilot to validate the concept. Following a lean approach, it is advised to start small and rapidly scale. Running pilots in selected areas, evaluating outcomes, and refining the concept before the official rollout can save time and money, while fully leveraging the potential and value of AI in supply chains.
- **Change Management and Training:** Successful AI integration requires supportive organizational culture and trained personnel. We provide change management support and training programs to equip employees with the necessary skills and knowledge to embrace and leverage AI-driven supply chain solutions effectively.
- **Continuous Support and Optimization:** We remain committed to our clients beyond the initial implementation phase. We provide continuous support and optimization services to ensure that AI-powered supply chain solutions deliver sustainable results. Our team monitors system performance identifies areas for improvement and fine-tunes algorithms and models to align with evolving business needs and market dynamics.

## Conclusion

While for many years AI was primarily focused on research, the implementation of AI for corporate purposes across a wide range of application fields is becoming more and more prominent. The integration of AI in supply chain management enables a shift towards a more sustainable, agile, resilient, and efficient system. Use cases that add value and improve processes and product innovations are applicable across all levels of supply chain management: strategy, planning, and operations. To facilitate the implementation of AI-supported supply chain management, six essential implementation steps are provided in the guidelines. Additionally, four basic success factors are to be considered during the implementation project:

- **Process vision and KPIs:** to give the AI journey a direction and to measure its success.
- **People and organization:** a culture that supports innovations and people with an understanding and the skill for implementing AI sets the AI journey at work.
- **Data foundation:** breaking up silos, connecting the dots, and ensuring data quality is crucial.
- **Technology and tools:** the choice should consider both maturity and feasibility of the tools.