miebach
the supply chain engineers

AI in Supply Chain Management
Intelligent Performance Improvements

AI is "at low price and realizable" to everyone

Costs for Artificial Intelligence (AI) have dropped in the recent decades. With the current computer technology, available methods (including: source code) and the various data sets available in companies and public/social plattforms, almost every company could apply AI to achieve a benefit. Prediction (= AI) is applied in more and more applications – from traditional stock management and sales forecast to all corners of your life – from sleep quality monitoring to heartrate data collection and analysis with your fitness tracking watch.

Artificial intelligence doesn't really bring intelligence as long as AI is not in the deciding role – but it is a quantum leap in prediction methodologies fighting uncertainty in all processes.

PREDICTION
Prediction is the process of filling in missing information. Prediction takes information (= data) that is available in your company or from outside and uses it to generate information the company does not have but needs.

AI beats traditional statistics

Statistical regression analysis has been the most applied prediction method for decades. Traditional statistics emphasize being correct on average, AI does not require that. Traditional statistics methods require the articulation of hypothesis for model specification – AI does not need that in the same amount, and AI can represent much more complex models with many more interactions between variables.

STATISTICS
A physicist, an engineer and a statistician are on a hunting trip. They are walking through the woods when they spot a deer in the clearing. The physicist calculates the distance to the target, the velocity and drop of the bullet, adjusts and fires, missing the deer by five feet to the left. The engineer looks frustrated. "You forgot to account for the wind. Give it here." After licking a finger to determine the wind speed and direction, the engineer snatches the rifle and fires, missing the deer by five feet to the right. Suddenly, without firing a shot, the statistician cheers, "Woo hoo! We got it!"

AI in Supply Chain Management
Intelligent Performance Improvements

How does it work?

AI based on neural networks for predicition is more or less a pattern recognition – initially trained and permanently self-learning and self-improving. To give an example: Picture recognition of a specific animal – try to decribe how to identify "a cat" with rules in a decision tree – an AI system based on neural networks simply learns by training with data (pictures) and feedback.

Where and how can I apply AI in my company?

Everywhere – there are no technical limits – everything is possible.

What is the specific prediction problem you want to get solved?

This is a much better question leading you to the requirement: first you need to precisely define your problem and the solution expected. Supply chains are the perfect playground for all AI methods because of the various uncertainties.

To describe a problem we recommend the AI Canvas, dividing the problem/solution into 7 elements : Prediction, Judgement, Action and Outcome on the process level, and in parallel Input, Training and Feedback on the AI system level.

To show an example: In 2014 Amazon optained a US patent for "anticipatory shipping" – this means a strategic shift in the business model from ordering-then-shipping towards shipping-then-ordering (or accepting).

The AI canvas:

PREDICTION	JUDGEMENT	ACTION	OUTCOME
• Online order of specific SKU by customer?	• Customer satisfaction by faster delivery vs. costs for wrongly shipped/rejected items	• Shipment (and delivery) of SKUs already before customer orders	• Improved customer satisfaction = sales increase = sales/profit • Strategic Impact: Threat for all other B2C retailers – Amazon to gain uncatchable lead in service and business model

INPUT	TRAINING	FEEDBACK
• Historical sales data per SKU and customer • Order patterns • Customer data: CRM data, social data, social media, credit cards, education, etc.	• Order patterns • Rejecting reaction by customers	• SKU info and share of wrong deliveries/ rejections • SKU info and share of accepted deliveries

Prediction can help you in forecasting fashion trends by systematically analysing influencers, competitors and consumers, identifying exactly the product of tomorrow bringing you into a lead position. Prediction is the next logical step in S&OP processes – once you have implemented the relevant agile processes the next level is to work on AI prediction tools.

Precise prediction will help you to optimize stock levels and production capacities in order to avoid any out-of-stock/production stops. AI in risk management helps you to identify potential supply chain risks in a "cloud of influencing parameters" as early as possible and to trigger respective measures (change of production plan, re-order with airfreight, etc.).

Miebach Consultants have been successfully designing supply chains for over 45 years. We do know AI for supply chains for almost all industries. Get in touch with us if you want to discuss your current challenges.