PKF O'CONNOR DAVIES ACCOUNTING | BY JOHN WOCHINGER AND GIOVANNI RIVERA

USING AI TO TRANSFORM YOUR SUPPLY CHAIN

CRITICAL TIPS FOR MANUFACTURERS

As artificial intelligence (AI) evolves, it proves to be an effective tool for businesses. Companies can use it to reduce costs, improve product quality and enhance efficiency, compliance and risk management, ultimately leading to higher overall performance. Manufacturing companies, in particular, can boost competitiveness, improve profitability and drive innovation by integrating AI into their supply chain management, enabling employees to shift their time and focus to more strategic, innovative aspects of their operations.

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As we look across various manufacturing functions, we find four that will greatly benefit from AI adoption: Quality Assurance, Inventory Management, Supplier Selection and Delivery Logistics.

1. QUALITY ASSURANCE: DETECT PRODUCT DEFECTS AND THEIR CAUSES

Detecting complex or even subtle product defects and identifying the root cause of a quality issue can be difficult to achieve by human inspection alone; AI technology can simplify this. Integrating AI embedded with algorithms such as machine- and deep-learning models into the quality assurance process can help streamline and expedite the detection of product errors and defects.

• **Benefits:** Allowing management to recognize quality issues earlier in production helps companies save resources and minimize costs associated with reworking or scrapping faulty products. Since AI systems can continuously learn and adapt to new data, their accuracy improves over time. By analyzing new and historical product defects, AI models can even help prevent future product failures.

• **Examples of Use:** The automotive industry is using deep learning algorithms such as convolutional neural networks (CNN) and advanced visions systems to identify aesthetic or structural problems with precision and improve the reliability and safety of new vehicles.

2. INVENTORY MANAGEMENT: OPTIMIZE LEVELS AND AVOID OBSOLESCENCE

Effectively managing inventory is a critical factor of profitability for manufacturers. Yet being able to match product types, features and quantities across markets and knowing in advance when to upgrade or sunset a product is tricky to balance. AI can provide the tools to help manufacturers optimize inventory levels and manage obsolescence. Machine-learning technology has been used for many years for predictive analysis to perform various functions in multiple sectors. The capability of identifying patterns in the datasets along with the built-in intelligence of deep-learning and neural networks is making the technology so powerful.

• **Benefits:** Utilizing machine-learning algorithms to analyze historical sales data and patterns, market trends and customer behavior helps accurately forecast future demand and identify products at risk of becoming obsolete. It allows businesses to take proactive measures to reduce overstocking and related costs. The ability to view and track inventory levels along the supply chain at any given time provides enhanced visibility, allowing manufacturers to respond to disruptions more efficiently. Information collected from point-of-sale locations, customer reviews from various sources and social media posts can be analyzed using AI to gather

information that can generate alerts for demand changes due to various factors. Management can adjust their production levels by anticipating fluctuations in demand, such as panic buying, which in turn helps optimize warehouse capacity.

• **Examples of Use:** Amazon Forecast is an example of a fully managed service that uses statistical- and machine-learning algorithms to deliver time series forecasts. According to Amazon Web Services, More Retail Ltd. (MRL), one of India's top grocery retailers, used Amazon Forecast to increase its demand forecasting accuracy from 24% to 76%, reducing wastage by up to 30% in the fresh produce category.

3. SUPPLIER SELECTION: LET AI DATA DIRECT YOU TO THE BEST

Being able to objectively collect and compare key data sets across suppliers over time is invaluable to help select the best for your business. AI can help by analyzing supplier performance metrics such as delivery times, quality, past performance reviews and cost to objectively assess a supplier's reliability and consistency.

• **Benefits:** AI can provide a more comprehensive and accurate assessment of potential suppliers and match specific procurement

needs with the capabilities of potential suppliers, identifying those that best meet required specifications.

• **Examples of Use:** Use AI to identify potential risks associated with a supplier, such as financial instability, compliance issues or geopolitical concerns to help proactively mitigate.

4. DELIVERY LOGISTICS: PLAN SMARTER ROUTES

Inefficient delivery routes cause a myriad of problems for manufacturers that can increase travel time/cost for delivery staff, vehicle fuel consumption and delivery times to customers. AI can be used to optimize delivery logistics by enabling smarter route planning designed to reduce travel/delivery times, consumption and cost.

• **Benefits:** Route optimization software and AI-powered GPS tools can optimize delivery logistics by creating the most efficient routes for fleets depending on road conditions and other factors. The technology has multiple levels of complex features and algorithms that are implemented within AI models for various tasks.

• **Examples of Use:** Algorithms such as ant colony optimization, dynamic programming, deep reinforcement learning, logistic regression and K-means clustering are used for classifying, understanding volume and regulating inventory logistics. Gradient

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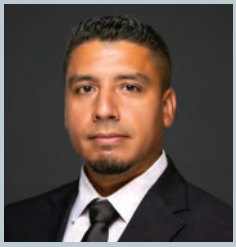
boosted machines are used for ranking and prioritizing shipments by learning complex interactions between features and other analyses involving sales volumes, customer value to the company, contractual requirements and product availability. Time series forecasting, polynomial regression and recurrent neural networks are used for predicting deliveries, distance or consumption based on multiple parameters.

LET AI DO ITS JOB. FREE YOUR COMPANY TO STRATEGIZE AND INNOVATE

As AI continues to evolve, manufacturing companies will have the opportunity to capitalize on its many benefits. Integrating AI into normal operations is a cost-effective solution that improves operating efficiency, enhances contract review, optimizes inventory levels and allows management to redirect labor resources to other critical areas.

Contact Us. Our specialists at PKF O'Connor Davies can help your company review its current operations, identify the AI technology that makes the most sense and design an appropriate implementation plan. If you have any questions or would like to discuss further, please contact our client service team.



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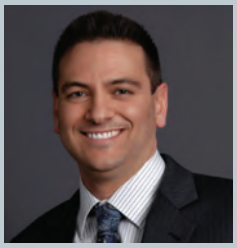

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