# 10 Areas Manufacturers Might See an Impact from AI

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Few technologies have changed the manufacturing industry as much as ERP software. From automated scheduling to precision inventory management, automated purchasing, real-time job costing and more, ERP simplifies production processes so manufacturers can work faster and more efficiently while delivering a quality product on time every time. The next transformative technology – artificial intelligence (AI) and machine learning (ML) – is already having a significant impact on our industry by changing the way manufacturers collect, process, and analyze data.

Over the past decade, one of the biggest advances in ERP has been the ability to communicate and integrate with machines and external software programs to lower costs and increase efficiency. For example, BOM Compare software can reduce engineering costs and get jobs into production much faster by expediting the design to production process. Integrating ERP with Nesting software can significantly lower material and labor costs and reduce scrap by automatically determining the most efficient way to cut parts on a piece of metal.

AI takes these capabilities to new levels with unprecedented predictive data tracking and analysis. AI can be programmed to learn from the data ERP software gathers to make deeper and more accurate predictions regarding customers, buying habits, inventory levels, markets, material purchasing and more.

Before we list 10 ways AI is enhancing ERP capabilities, let's look at what makes it a game-changing technology.

# AI: Computer Self-Learning at Your Service

The magic of AI is that it gives machines the ability to learn from experience so they can adapt to new inputs and perform tasks that have always been performed by humans. This requires computers to engage in deep learning and natural language processing so they can understand, interpret and manipulate human language. When computers integrate with these technologies, they can be trained to accomplish specific tasks by processing and recognizing patterns in vast amounts of data.

This doesn't mean AI can accomplish tasks without human guidance. AI needs people to set up the system to recognize patterns and ask the right questions. When programmed correctly, AI can:

- Automate repetitive learning

- Add intelligence to existing products

- Achieve incredible accuracy through deep neural networks

- Adapt itself through progressive learning algorithms so the data can do the programming

ERP gives manufacturers an advantage by tracking data in every aspect of the business. AI goes a giant step further by analyzing more data at a deeper level. When AI algorithms become self-learning, the data becomes an extremely valuable asset.

# 10 Ways AI Can Make Your Manufacturing Better

The goal with integrating AI and ERP is essentially the same as ERP when it was first developed – simplifying manufacturing to improve operational efficiency and increase profitability while growing the company. The difference is that with AI manufacturers can track and analyze predictive data as well as current and historical. With its self-learning capabilities, AI can also assist manufacturers in their decision-making when the relevant data, parameters, and variables exceed human understanding.

## 1 Inventory Management

AI-integrated ERP software helps manufacturers optimize inventory management by predicting demand, identifying slow-moving products, and automating order fulfillment. According to a study by McKinsey, companies that utilize AI to optimize inventory can reduce inventory levels by up to 50%.

Managing inventory is mostly a reactive process, measuring stock levels and ordering materials based on historical usage and seasonal trends combined with estimates of expected customer orders. AI-based inventory planning makes it more proactive with:

- Increased visibility of inventory KPIs
- Improved product, channel and location forecasting that includes seasonality and trend data
- Automatic classifying of SKUs to identify what's needed to meet demand
- Replenishing SKUs faster with predictive ordering based on anticipated changes in supply and demand
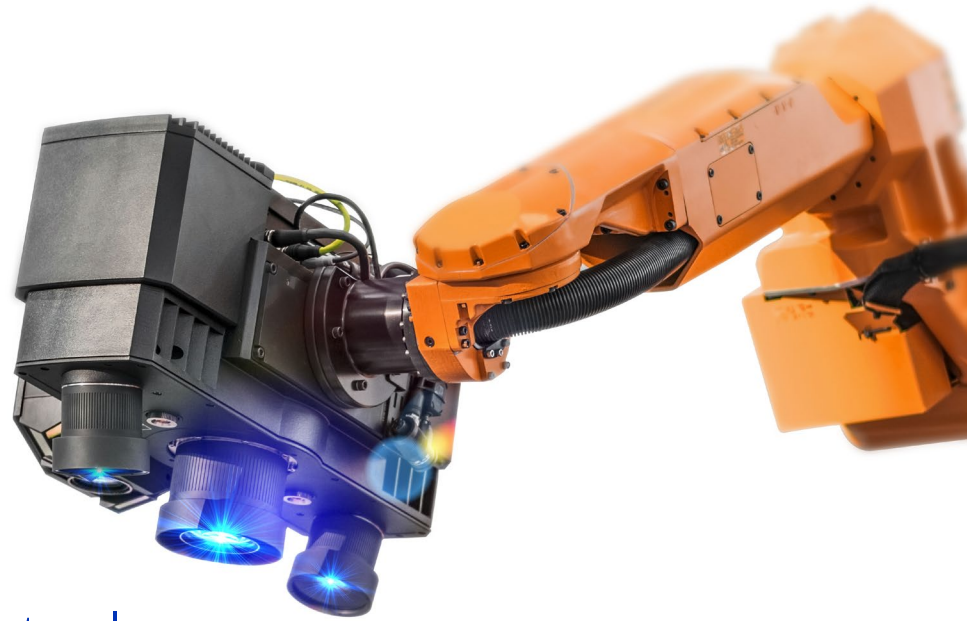
# 2 Quality Control

AI-based inspection systems can identify defects and anomalies in manufacturing processes in real-time, thereby reducing the risk of product recalls and improving overall quality. For example, image recognition algorithms are capable of analyzing images of products on the assembly line to identify defects that may not be visible to the human eye.

AI is also changing the way quality gets inspected. Machine vision is an integral part of many quality applications. With its deep learning capabilities, AI-powered quality control software can self-learn which aspects are vital and create rules that determine the features needed to define quality products.

# 3 Pricing Optimization

AI-powered ERP software can optimize pricing by analyzing market trends, competitor pricing, and customer behavior. With this data, manufacturers can make better-informed decisions to optimize prices for their products, resulting in higher profits and better customer satisfaction.

AI's deep data dives allow you to model how customers will respond to price changes based on historical sales data. It also lets you factor customer behavior into pricing strategies, predict how different prices will impact sales, and combine experience and data to increase prices without damaging sales. AI predictions aren't 100% accurate, but they inform gut feelings about effective pricing strategies.

# 4

# Demand Forecasting

AI can be used to predict demand for products based on historical data, market trends, and customer behavior, helping to optimize production schedules, reduce lead times, and avoid stockouts. With AI you can predict consumer demand for every SKU by taking into account seasonality, pricing, promotions, and product lifecycles.

AI offers the unique ability to engage in demand forecasting across different time horizons. This includes near-term demand sensing, a forecasting method that combines AI and real-time data to create a forecast based on current supply chain conditions. Other AI-enabled forecasting includes direct-to-consumer and e-commerce. AI can also combine supply, sales, finance, and marketing projections into a holistic view of demand across your entire enterprise.

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# 5 Supply Chain Management

As we all experienced during and after COVID, disruptions to supply chains can create serious problems. AI-powered ERP software helps optimize supply chain management by predicting supplier lead times, identifying bottlenecks, and optimizing logistics routes to reduce lead times, lower costs, and increase customer satisfaction.

AI algorithms analyze data to predict which products will be in demand and in what quantities, reducing strains on specific links of your supply chain. AI can also provide upgrades to important supply chain elements, including:

- Improving warehouse supply and demand management
- Improving the health and longevity of your transportation vehicles
- Making your loading processes more efficient
- Helping supply chain managers reduce costs and increase revenues

# 6 Predictive Maintenance Scheduling

Proper maintenance is essential to minimizing downtime, reducing repair costs and extending the life of your machines and equipment. AI helps achieve these goals by predicting equipment failure and scheduling preventative maintenance before a breakdown occurs.

AI collects and processes data from sensors, cameras, logs, and other sources. Engineers then analyze the data to make predictions and recommend maintenance actions. In addition to protecting your machines and equipment, AI can:

- Improve safety by minimizing human errors and accidents
- Reduce quality defects
- Increase efficiency and productivity
- Support innovation, sustainability and environmental compliance with data-driven decision making

# 7 Labor Management

Labor costs are often the biggest line item in the manufacturing budget. AI-powered ERP software can help reduce labor costs and increase productivity by predicting employee productivity, identifying training needs, and optimizing scheduling.

AI can also alleviate another costly labor problem – workplace injuries – by limiting shop floor personnel's exposure to powerful, unwieldy machinery and dangerous tasks. AI does this by streamlining or automating risky processes that can lead to serious injuries.

# 8 Real-time Analytics

AI-powered ERP software provides real-time analytics on key performance indicators such as production rates, inventory levels, and quality metrics to help you make data-driven decisions and identify areas for improvement.

While conventional data analysis methods do a good job of organizing and distributing IoT data, AI does it faster and with greater precision by identifying patterns and inconsistencies in real-time. AI algorithms process data from different sources and present it in a consistent manner, making it easier to structure the data for analysis. AI speeds up real-time analytics by preparing, analyzing and assessing data as soon as it is available.
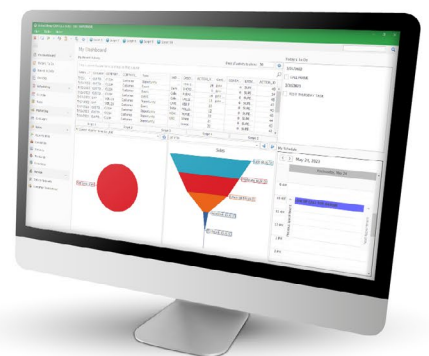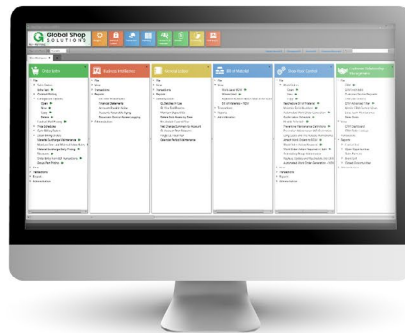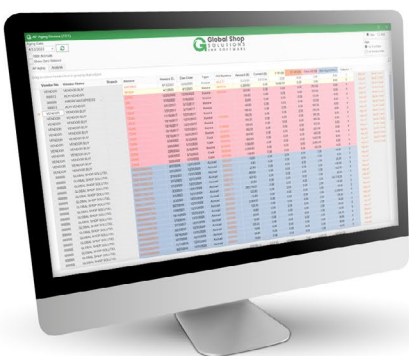
# 9 Labor Shortages

AI can even help with labor shortages through robotic automation, additive manufacturing, and machine vision. AI applications enable robot arms to safely handle objects on the production line regardless of their orientation, speed, or placement. With these abilities, robots can be trained to perform various types of assembly line work done by humans.

Assembly line work is repetitive, labor intensive, and prone to error. Even with years of experience, highly skilled designers and engineers often use a "best guess" approach when creating design solutions. AI empowers the development of complex, highly optimized designs that can be accurately produced with 3D printing. AI-driven autonomous machine vision can count and track items, identify defects, and properly sort products using cameras and specific lighting conditions.

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# 10

## Autonomous Manufacturing

AI can be used to automate manufacturing processes, reducing the need for human intervention and increasing efficiency. AI robots tap into machine learning algorithms to automate repetitive tasks and decision-making. Robotic process automation can perform repetitive tasks like data entry and order processing, but it can also handle more complex tasks, such as spotting anomalies on the production line.

AI-powered robots can work side-by-side with humans. Autonomous mobile robots can transport packages within the warehouse, while collaborative robots (cobots) assemble products alongside humans on the production line. These factory robots combine the precision and efficiency of machines with the skills and intelligence of human operators, taking product quality to new levels.

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## Say Hello to Big Data

As with many industries, manufacturing has begun to gravitate toward Big Data. ERP made it possible for manufacturers to make data-based decisions by tracking large amounts of information. Big Data enables predictive forecasts regarding sales, pricing, material availability, and other key metrics. AI makes gathering and analyzing those mountains of data provided by ERP possible.

The complexity of AI algorithms can be daunting. Yet, their ability to look into the future as well as today and the past are mind-boggling and exciting.

**ABOUT THE AUTHOR**

**John Davis** serves at CTO for Global Shop Solutions and is a 20-year veteran of the ERP and manufacturing industry. As a graduate of Utah State University, Davis is exceptionally gifted at building ERP software that simplifies manufacturing for Global Shop Solutions customers.