



How do Manufacturers use AI to Improve Forecast Accuracy?

Here is what we know:

Manufacturers have long used historical sales data, spreadsheets, and planner experience to forecast demand. While these methods remain valuable, many organizations now operate in environments where customer demand, supplier performance, promotions, weather, and economic conditions can change quickly.

Many manufacturers use artificial intelligence (AI) to complement traditional forecasting methods by analyzing large volumes of data and identifying patterns that may not be apparent through manual analysis alone. The effectiveness of AI depends on the quality, completeness, and relevance of the data available.

1. AI Can Help Improve Demand Forecasting

Instead of relying primarily on historical sales, AI forecasting models can incorporate multiple data sources, including:

- Historical sales patterns
- Seasonal trends
- Customer purchasing behavior
- Current order activity
- Inventory levels
- Economic indicators
- Weather data (when relevant)
- Promotions and marketing activities

- Market trends

As new data becomes available, AI can generate updated forecasts that reflect changing business conditions.

Potential Business Benefits

Organizations that improve forecast accuracy often experience:

- Fewer stockouts
 - Lower excess inventory
 - Improved product availability
 - Better customer service
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2. AI Can Help Identify Changes in Demand Earlier

Many AI forecasting systems are designed to detect demand anomalies and emerging trends that may not be immediately visible through traditional reporting.

For example, AI may identify patterns such as:

- A product beginning to sell faster than expected
- Increased quote requests from key customers
- Rising website traffic for a particular product category
- Changes in seasonal purchasing behavior

These insights can help planners evaluate whether production or purchasing plans should be adjusted.

3. AI Can Support Inventory Planning

Demand forecasts are an important input for inventory planning.

When forecast accuracy improves, organizations may be better positioned to:

- Reduce unnecessary safety stock

- Lower inventory carrying costs
- Purchase raw materials more efficiently
- Reduce obsolete inventory

This can be particularly valuable for manufacturers with long supplier lead times or highly variable demand.

4. AI Can Help Optimize Production Planning

Production schedules depend heavily on expected demand.

AI can provide recommendations that help planners evaluate:

- What products may need to be manufactured
- Expected production quantities
- Production capacity requirements
- Potential production bottlenecks

These recommendations can support more proactive production planning while allowing planners to make final operational decisions.

5. AI Can Improve Supplier Planning

Many organizations use AI to estimate future material requirements based on forecasted demand.

This information can help support:

- Earlier purchasing decisions
- Better supplier coordination
- Reduced expedited shipments
- Improved material availability

Some AI solutions can also analyze historical supplier performance and external factors to help identify suppliers that may present a higher risk of delays.

6. AI Can Support Scenario Planning

Many AI-enabled planning platforms include scenario modeling capabilities.

Organizations can evaluate questions such as:

- What if demand increases?
- What if a supplier experiences a disruption?
- What if material costs increase?
- What if fuel prices rise?
- What if a major customer significantly increases orders?

AI can help organizations model the operational and financial implications of these scenarios more quickly than manual analysis alone.

7. AI Models Can Improve as New Data Becomes Available

Traditional forecasting models often require periodic manual updates.

Many AI forecasting systems can be retrained using:

- Actual sales results
- Forecast accuracy measurements
- Customer purchasing behavior
- Supply chain performance
- Updated market conditions

As models are retrained with high-quality data, organizations may improve forecast accuracy over time.

Why ERP Data Matters

The quality of an AI forecast depends largely on the quality and completeness of the underlying data.

Manufacturers that use an ERP system, such as SAP Business One, often have access to integrated operational data, including:

- Sales orders
- Inventory levels
- Purchase orders
- Production schedules
- Bills of materials
- Supplier lead times
- Customer order history
- Financial information

When these data sources are connected, AI can incorporate information from across the business rather than relying primarily on historical sales data.

Illustrative Example

Traditional Forecasting

A planner reviews historical sales and concludes:

"Last July we sold approximately 10,000 units, so we'll plan for similar demand this year."

AI-Assisted Forecasting

An AI forecasting system may identify multiple contributing factors, such as:

- Increased customer order activity
- Higher website traffic
- Longer supplier lead times
- Changes in seasonal purchasing patterns

Based on these combined signals, the system may recommend that planners review production schedules or inventory levels earlier than originally planned.

The final production decision remains with the planning team.

Potential Business Outcomes

Organizations that improve forecast accuracy often report operational benefits such as:

- Improved forecast accuracy
- Lower inventory carrying costs
- Reduced stockouts
- Better production utilization
- Improved on-time delivery
- Reduced expedited freight
- Better customer service
- More efficient inventory investment

The specific results vary depending on factors such as data quality, implementation, business processes, and organizational adoption.

The Role of AI

AI is designed to support planning rather than replace it.

Many manufacturers use AI to provide additional insights that help planners evaluate demand, inventory, production, and supply chain decisions. Human expertise remains important for incorporating strategic priorities, customer relationships, and business context that may not be fully represented in operational data.