Improving plant performance is an effort that includes both growing revenues and cutting costs.

Almost half of manufacturing executives are focused on demand forecasting and inventory management, which are two sides of the same coin, according to a 2013 study by Gatepoint and IBM, “Five key factors in optimizing complex manufacturing businesses.”

The challenge at all stages of the manufacturing process – from raw materials to finished goods – is having enough inventory on hand to complete orders.

Excess inventory represents tied-up cash that can’t be used for other purposes and may become a disposal problem. Too little inventory means loss of orders and perhaps customers. With the availability of online ordering, customers can quickly locate other options.

A great tool to improve demand forecasting and inventory management is inventory optimization software. These systems “bolt on” to existing systems, so the first step is to make sure you’re getting good data.

Some companies are using Electronic Resource Planning software to manage inventory. These applications track inventory components received and their journey through the process.

In many companies, this is far from seamless. It’s vital to ensure that there are no gaps in the system and the information entered and reported is correct. After all there is no point in boosting an engine that isn’t running on all cylinders.

Your system should accurately track inventory levels, orders, lead times, costs and the menu of materials used in each product. In some companies, materials management can be very complex, since a mix of raw materials and purchased components are used. For each inventory item, whether raw or component, demand, safety stock levels. Minimum order requirements need to be identified.

Knowing exactly how much inventory you have on hand at every stage of the process is essential. Once you have this information, you’re ready to optimize.

The most exciting aspect of new optimization software is the ability to create multiple scenarios based on variable inputs and what-ifs. Demand isn’t always a smooth bell curve and marketplace changes can happen rapidly.

All customer groups don’t perform the same way. Software company Llamasoft’s inventory optimization tool classifies demand in ten groups, including fast, slow, intermittent, erratic, lumpy and clumped.
The demand forecast is used to identify safety stock amounts as well as optimal production. Companies use the results to run production of associated items or postpone production entirely. Cost and profit trade-offs are identified, and various scenarios can be modeled with output reported against existing performance. Case studies show a reduction in needed safety stock, reflecting a savings.

This type of modeling can be helpful if a company sells parts in addition to equipment or vehicles. Accurately modeling the demand cycle for parts can save both inventory and warehousing costs while ensuring that customers get those essential items when needed.

Another area optimization software addresses is network optimization. Many companies use suppliers or production plants around the world, which makes purchases of inventory components and movement of finished goods more challenging.

Lead times can be much longer, and weather and political events can interfere with delivery. Being able to enter different time periods is helpful since conditions and demand can be seasonal.

Modeling “what-ifs” to gauge the impact of decisions is also useful. For example, a company may evaluate moving a distribution center or switching suppliers.

In a Llamasoft case study of a dairy products company, wide variations in delivery times overseas affected projected stock levels. These variances needed to be considered in forecasting. Pricing sensitivity due to fluctuations in commodity prices was also an input.

Another feature of optimization software is simulation. The effect of decision-making can be virtually produced before a dime is spent.

A consumer goods company struggling with uneven demand and scheduling problems decided to investigate grouping production by speed of sales – i.e., fast moving and slow moving. The simulation revealed a 40 percent improvement in stock levels while meeting demand and improving productivity.

Inventory optimization is a complex process and software tools are helping make the process increasingly more accurate and useful. They are also opening up possibilities for innovative solutions for using production capacity and distribution networks to the fullest.