

# Sales and Operations Planning at Elkay Manufacturing: A Case Study

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## BACKGROUND

Elkay Manufacturing Company, founded in 1920, is an international designer, marketer, producer, and distributor of sinks, faucets, pressurized water coolers, and kitchen cabinets. These products are sold through plumbing wholesalers, mass merchants, and hardware stores. Elkay, which is privately held, employs about 4,000 people worldwide and is headquartered in Chicago, Illinois. This presentation focuses on the Elkay Division, which supplies sinks, faucets, and coolers from six domestic and two international locations. Elkay's wide range of products is suitable for every application from the top-line gourmet kitchen to the weekend do-it-yourself remodeler.

Elkay's manufacturing strategy is largely make-to-stock, but has a considerable amount of make-to-order "specials" on a daily basis. Principles of JIT and lean manufacturing implemented over the past five years have resulted in factory flow lines for final assembly, which are supplied with fabricated components by feeder departments. All facilities are working on implementing point-of-use storage, visual kanban pull systems, various quality initiatives, setup reduction, and rate-based due-date-driven production planning. The objective is to synchronize daily production to customer demand as much as possible, while maintaining low cost and high delivery performance.

The primary performance measures are safety, quality, cost, delivery, and inventory. Each of these has supporting performance measures that address specific operating objectives. These are reported by the plants daily, and reviewed with the vice president of operations weekly.

In 2000, Elkay Manufacturing recognized a need to further improve competitive performance in terms of on-time delivery, fill rate, cycle time, and inventory turns. An enabling objective was to link top management planning to the day-to-day production line capacity and priority, and to purchased material. The management team determined that sales and operations planning was a key strategy in achieving these objectives by balancing demand and supply on a regular basis through this high-performance top management communication process. The vision was that S&OP would provide a "one-plan process" for synchronizing

sales, finance, manufacturing, materials, human resources, and engineering. It also would provide the foundation architecture for using ERP to drive seamless planning through the organization.

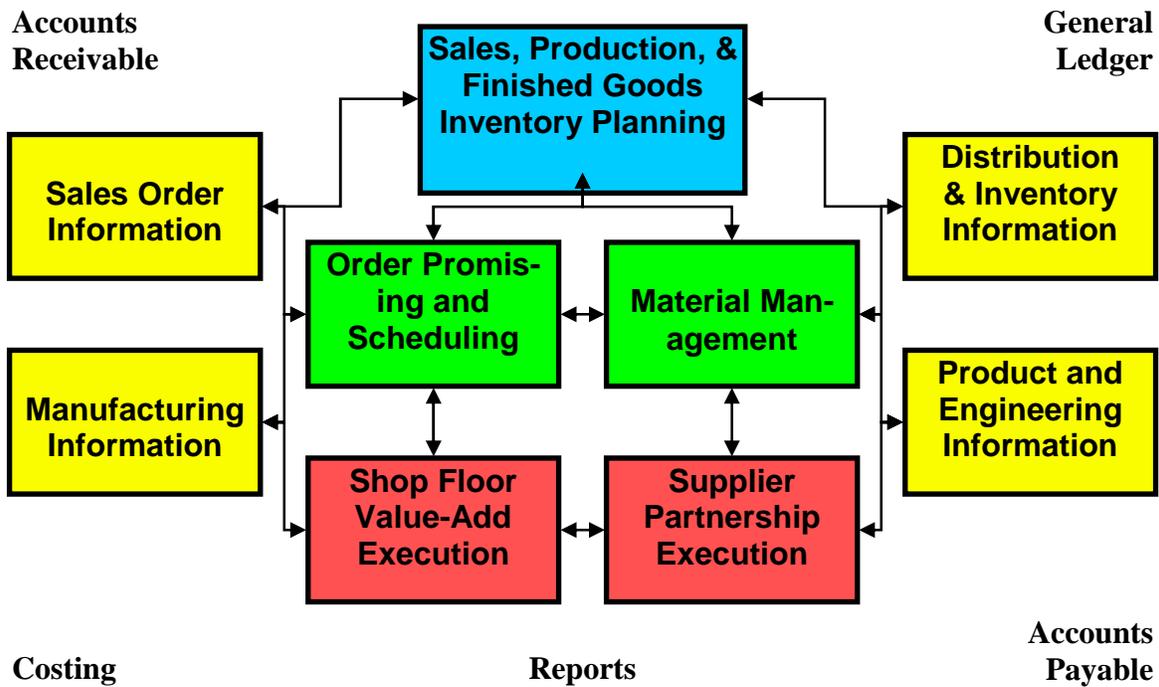
The presentation describes why S&OP was implemented, how it works, and how they did it. In the presentation, specific formats, reports, and related information will be presented that are not published in this paper.

## SALES AND OPERATIONS PLANNING OVERVIEW

Sales and operations planning (S&OP) is a proven top management method for making timely proactive resourcing decisions for labor, fixed cost, capital, key materials, and core based on demand and supply balancing. Many manufacturers have discovered the power of this practice and are successfully applying it to lower cost, provide the best service, and minimize investment.

S&OP is a monthly formal balancing of supply and demand through a 6-to-12-month planning horizon by aggregate product families. It generally includes incoming orders, backlog, shipment, finished goods inventory, production, and capacity projections in monthly time buckets. It is conducted in a very prescribed format by the top management team. This is a critical point: top management. Any company that embraces this process must engage the president and direct reports. Otherwise, there will be a disconnect between their wishes and the information on the formal S&OP document.

The major objective of S&OP is to provide a "one-plan process" that connects all functional areas of the business from top management to the shop floor on a regular basis. In its absence, each functional area is likely to have plans that are disconnected at best, and in absolute conflict at worst. It is this objective that makes S&OP the tool that connects top management planning seamlessly with day-to-day factory execution. This is a huge benefit! Without this connectivity, the factory will often run to a set of assumptions that are extremely disconnected from the top management team. Purchasing will commit money and manufacturing will position people and equipment in a way that can easily be way out of sync with demand, inventory, and backlog objectives.



**Figure 1.**

**HOW S&OP GOT STARTED AT ELKAY**

In a recent meeting, the vice president of sales was heard saying, “We couldn’t have done this two years ago.” This comment was in reference to a very focused discussion in the S&OP meeting regarding how to best plan production and inventory to satisfy increasing demand over the next few periods. In late 2000, Elkay realized that in order to lower the cost of production while improving customer service, the formal balance of supply and demand had to be addressed.

At that time, sales produced a forecast that was used in a variety of disconnected ways by the various manufacturing groups. Finished goods inventory was a result of the disconnect, not strategically planned. The “demand-siders” and the “supply-siders” did not have a meaningful/formal “handshake” and agreement on the sales, production, and inventory plan. It was the recognition of this fundamental need that drove Elkay to use S&OP as the “best practice” to balance supply and demand.

But there was more. In addition to this traditional definition of S&OP, Elkay chose to expand the boundaries to include a systemic link to detailed scheduling and material planning, and then drill it right down to shop floor execution and purchasing. **Figure 1** shows the expanded S&OP business model used by Elkay.

Traditional S&OP is in the top middle box. This is where the top management demand and supply balance takes place. The next two boxes,

order promising and scheduling, and material management, include all of the detailed planning derived from the top-level S&OP. The bottom two boxes, shop floor and supplier execution, carry out the planning activity via system driven schedules and various visual kanban techniques.

This expanded S&OP model ensures that the Elkay planning process is linked seamlessly from top management to day-to-day operations execution. This approach and scope is relatively unique for the entire subject of S&OP, and will continue to expand the process benefit.

**THE RESULTS ACHIEVED**

Operationally, 2001 was an outstanding year for the Elkay Division. The results shown below are due largely to the S&OP process (as well as other initiatives), which allowed the management team to make fact-based decision quickly and regularly as a unified organization.

Performance Measure	Change from 2000 to 2001
Total inventory dollars	32% reduction
Total inventory turns	35% increase
On-time shipments	25% improvement to 91%
Backorders	35% reduction
Cycle time	48% reduction to 7.7 days

## **THE ELKAY S&OP PROCESS**

The six steps described in the following paragraphs summarize the Elkay S&OP process. These are a combination of recognized S&OP best practices tailored to suit Elkay's operating characteristics.

### **Step 1: Collect the Period End Actuals**

The accounting calendar is based on four-week and five-week periods (not months) in a 4-4-5 quarterly rotation. The period always ends on Friday, which allows a consistent calendar in terms of the S&OP process steps. Period actuals are reported from the business system at 8:00 a.m. on the Monday following the end of the period. By plant and business total, these include shipments in units and dollars by product family, finished goods inventory in units and cost by product family, and production in units and hours by producing line. It is important to capture inventory at a specific point in time since it is a constantly changing number. The S&OP coordinator captures these actuals.

### **Step 2: Update the Sales Forecast**

The marketing manager collects input from the internal sales organization, outside reps, marketing data sources, and other Elkay people during the first few days of the period. Based on all of the market intelligence, revisions to the forecast are made in units and dollars by sales business unit, commodity, and product family. There are four sales business units (Elkay, Halsey Taylor, Revere, and International), three commodities (sinks, fountains/coolers, and faucets), and 66 product families. The sales manager within each business unit is accountability for the sales forecast, and the Elkay marketing manager is accountable for aggregating the data. This step is accomplished by the fourth day of the period.

### **Step 3: Perform Preliminary Balancing of Demand and Supply.**

The S&OP coordinator receives the updated forecast from the marketing manager, and begins developing the production plan using finished goods inventory as the decoupler. There are five primary finished goods inventory locations, and the supply chain manager specifies stock items and inventory positions by location. The S&OP coordinator then specifies the production rates by family to accomplish these inventory positions. Next, a capacity plan is created in terms of earned hours by production line across all plants as a function of the production rates by family. The objective is to level or ramp the lines while maintaining the finished goods inventory position. This is an iterative process that includes altering the inventory

position, changing the number of production days by production line, and changing the split between plants. Once the S&OP coordinator has done this preliminary analysis, the pre-S&OP meeting can be held. Step 3 is accomplished between Friday and Monday.

### **Steps 4: Conduct Pre-S&OP with the Plant Managers.**

Now is when the fun starts. The S&OP Coordinator schedules a one-hour meeting with each plant manager to review the preliminary supply and demand balance. The division supply chain manager, the plant materials manager, the plant production manager, and others may attend this meeting. The objective is to review the line run rates and finished goods inventory position relative to the sales forecast. Usually, there is a considerable amount of discussion around short-term capacity issues. Adjustments are made until all are in agreement, issues for the S&OP meeting are identified, and decisions are noted. At times, the capacity plan will be completely rerun, a process that takes about 30 minutes. Step 4 is done on Tuesday, the seventh day of the period.

### **Step 5: Conduct the S&OP Meeting.**

The meeting is held monthly on the second Thursday, and lasts about two hours. The VP of operations, VP of sales, VP of finance, plant managers, marketing managers, supply chain manager, the S&OP coordinator and other people as needed attend it. Attendance is nearly perfect—the date is on the calendar for the year and doesn't change! This ensures participation.

The agenda is roughly 25 percent reviewing past period's actual *performance to plan* in terms of sales in units and dollars by product commodity, finished goods inventory in units and dollars by product commodity by plant, and production in earned hours by production line by plant. *Key metrics* by plant are also reviewed to show improvement trends in terms of order fill rate, cycle time, inventory turns, and delivery performance. Each person who is accountable for performance speaks to his or her numbers—this is critically important for the process to succeed.

The other 75 percent of the agenda is reviewing the outlook for the next several periods. Sales projections, finished goods inventory levels, and production line rates are discussed. Any issues needing attention are noted and action items assigned. These actions are reviewed at the next meeting. Generally, there is quite a bit of discussion, which ensures that all the players are on the same page. The outlook concludes with a summary of the entire Elkay Division and a review of the actions.

### **Step 6: Distribute the Information and Drill It Down Through the Planning Process.**

After the S&OP meeting, the total document is electronically distributed to the meeting attendees. It is their job to distribute the information appropriately. Part of this distribution is a “drill down” to the schedulers and the line supervisors. For example, at the Elkay Division, each production line has a white board that shows the number of units and earned hours to be accomplished each day. These numbers are taken directly from the S&OP document. As the period progresses, actual vs. plan performance is measured daily.

### **HOW ELKAY IMPLEMENTED S&OP**

In November 2000, Elkay top management decided to move forward with a formal S&OP process. The project was endorsed by the company president and co-championed by the vice president of operations and the vice president of sales. From kickoff to the first meeting was about three months. Another four months was required to mature the process. Implementation steps that have been taken as of this writing (May 2002) are as follows:

1. The project champions (VP operations and VP sales) held a kickoff meeting with senior management to review the project objectives, deliverables, and methodology. (November 2000)
2. The S&OP coordinator position was defined and filled. (December 2000)
3. The project team was formed including, plant manager (co-chair), marketing manager (co-chair), S&OP coordinator, MIS, supply chain manager, production manager, and TCA consultant. (December 2000)
4. A two-day S&OP education session was held for the champions, project team, and 25 other key operating managers. (January 2001)
5. The detailed project plan was developed. (January 2001)
6. The first cut of the S&OP process was designed including data sources for actuals, S&OP formats, performance measures, calendar, and meeting agenda. (January–March 2001)
7. The first S&OP meeting was held. (March 2001)
8. S&OP refinements and revision were made including data purification, preparation, format improvement, and data assembly automation. (April 2001–August 2001).
9. The process reached a level where it could effectively be used to manage the business. (August 2001)

10. The S&OP process linkage to detailed planning began, and continues to evolve. (July 2001–December 2002).
11. The process was moved from essentially a spreadsheet application to a totally ERP contained solution (PeopleSoft). (November 2001–May 2002)

### **FUTURE S&OP DEVELOPMENT**

As of this writing, the effort to link S&OP to the scheduling and materials planning functions are well underway, but are not yet completed. The intent is to schedule production lines to the daily run rates specified in the S&OP process, and to procure materials to support these schedules.

One important breakthrough feature is to have a daily schedule by production line that comes directly from the ERP system in a fit-for-use condition, and is used by supervisors on a daily basis to run the production lines. In this way, S&OP is linked to the shop floor. The schedule will be executed by a combination of kanban pull signals and take-action reports for stock items, and take-action reports for direct non-stock customer demand.

Material planning via traditional MRP logic will be linked to the output of S&OP via a planning BOM methodology. Actual replenishment will be triggered via MRP take-action reports, kanban signals, and VMI (vendor managed inventory).

All of these actions will be accomplished in 2002.

### **KEYS TO SUCCESS**

Successfully implementing S&OP in your company depends on a few, but very important, principles.

1. Top management must be on board and lead the effort. This doesn't mean they do all the work. But it does mean that they (1) show up at the meetings when they are supposed to, (2) make it clear in everyone's mind that this is not an optional activity, (3) provide the resources to get it done (S&OP coordinator, MIS support, S&OP experts).
2. Top management and operating management must use the S&OP process to run the business as a one-plan process. This is simple. When someone asks, “What are the projected shipments for next period?”, the answer comes from the S&OP document, not from another spreadsheet. When someone asks, “What is the daily run rate for line 410?”, the answer comes from the S&OP document, not from another spreadsheet. You get the idea. The S&OP document is a true statement of what we intend to do. If any other document is used, a multi-plan process exists which usually renders S&OP meaningless.

3. Show up. 90 percent of success is showing up. The right people must accomplish the specified process steps on time, and attend the scheduled meetings without fail. It is unacceptable to send substitutes, be late, or not attend. Successful companies publish an annual schedule of S&OP events and get it on every player's personal calendar. This way, everyone knows what is going on, when it is going on, and who is involved. Other activities can then be scheduled around S&OP.
4. Have flawless data presented in a fit-for-use condition. This applies especially to the actuals from the previous period. There is only one answer to "What did we ship?" Naturally, forecasted sales, production, and inventory will be best estimates, but should be understandable and formatted for easy use. If data is suspect, the process focus will be on who has the right number, rather than what are we doing to improve the numbers! We certainly want the latter.

### **SUMMARY**

Elkay Manufacturing had a need to improve competitive performance in terms of on-time delivery,

fill rate, cycle time, and inventory turns. Sales and operations planning was a key strategy in achieving these objectives by balancing demand and supply on a regular basis through this high-performance, top management communication process. In addition, S&OP became the foundation for using ERP to drive seamless planning through the organization. Traditional S&OP was accomplished in seven months, and expanded S&OP is in process as of this writing. The project was top management led and designed by a middle management project team. To find out more, we encourage you to contact one of the authors.

### **ABOUT THE AUTHORS**

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