

The Crystal Ball

How Demand and Supply Planning can improve business performance

By Thomas Teltscher and Stefan Schönberger

From the perspective of a single company, customer demand is highly volatile. This may be due to the volatile consumption further downstream in the supply chain (impact from customers of customers' customers) seasonal impacts or -especially in commodity markets- due to low customer loyalty. With dynamic economic developments and structural industry changes further uncertainty is added to foreseeing future demand.

Stocks are created along the supply chain to hedge against this uncertainty and volatility of demand, but these stocks will also contribute to uncertainty within a supply chain if their amount is unclear to all players involved. While buffering demand volatility, inventories also postpone actual demand signals to the suppliers, which may later impact them even more, when downstream buffers run out unexpectedly.

When the financial crisis turned into an economic downturn in late 2008, many companies were surprised by the speed of the decline and the sudden volume reduction. Of course the magnitude of the crisis was surprising - but with appropriate sharing of information throughout the value chain, adjustments for most players could have been initiated faster and earlier.

Since value chain partners traditionally do not sufficiently share demand and supply information with their supply chain counterparts, most companies remain in the dark when changes occur and consequently are forced to react rather than act.

The following article outlines ways for pulp and paper companies to deal with the volatility of demand, thus making it more transparent and predictable. The following questions will be highlighted:

- How to cooperate with business partners to enable more accurate business planning during downturns
- How to use similar techniques during times of "normal" economic environment to capture the benefits along the entire value chain
- How to channel available information throughout the organization to coordinate activities

The role of forecasting in pulp & paper

Most companies in the pulp & paper industry currently take a rather traditional approach to forecasting

and to capacity & sales planning. Business is often executed on an experience / "business-as-usual" basis where sales forces might, at best, give a rough estimation of their sales volumes to the producing units for the time to come. Those "forecasts" are often neither recorded nor measured nor controlled. Mills & plants then often are taken by surprise by changes in demand of some customers – especially of those who tend to change their orders on a short-term basis. Fortunately, there are also those customers whose demand is very steady providing for some stability and a foundation on which production, procurement & financial planning can be performed. It may appear likely that if every customer ordered as "randomly" as some seem to do, many production units would have a hard time coping with the demand volatility and its consequential effects on efficiencies of machinery, workloads of employees and, last but certainly not least, customer satisfaction.

Additionally, lacking knowledge of future demand leads to inaccurate procurement creating the Forrester Effect – more renowned as Bullwhip Effect.

The Bullwhip Effect

The Bullwhip Effect magnifies the problem laid out above. One element of a value chain with insufficient downstream market intelligence will create an impact upstream – on its suppliers. As the production of the one "blind" part of a value chain will become more erratic so will procurement. Signaling a sudden rise in demand will lead to increasing replenishment orders to satisfy raw material requirements of the increased demand. Consequently, suppliers will suffer from decreased stability of their sales in turn causing higher variability in their own operations. How much of this is actually real typically remains to be seen as the bullwhip demand is passed up the supply chain.

Figure 1 illustrates the Bullwhip Effect on a value chain using 20% variability per segment of the value chain. Thus, with a variation of only 20% (which for some customers or even product ranges can be common), the player in the centre of the value chain needs to "guess" whether to produce half or almost double his standard volume – provided he does not have information on the situation downstream in the value chain.

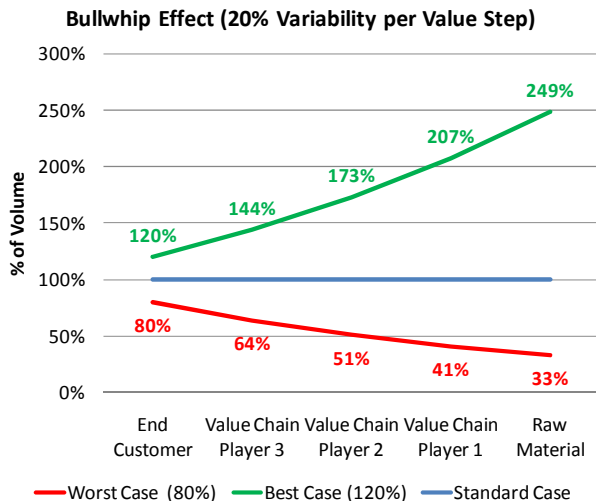


Figure 1 - Bullwhip Effect

The Bullwhip Effect, however, also works the other way. In a situation where a given raw material is in short supply – such as recovered paper in 2010 - those requiring the raw material will, in all likelihood, exaggerate their orders simply to get hold of their necessary volume. In short, they might order 120%, 150% or even more of their demand to secure 100%. Not very surprisingly, this will increase prices further since the gap between demand and supply will appear to be even bigger than it might be in reality.

The common denominator for the scenarios described above is the lack of information - information on supply & demand balance, information on demand development and information about the specific point in time when demand will occur. This is where forecasting & collaborative planning processes can help provide some insight.

Levels of forecasting & planning

Forecasting & planning processes are differentiated by level of detail and frequency of the process. Distinguishing between these levels is crucial. While the forecasting processes are internally driven, prime information is ideally obtained from up- and downstream value chain partners. Thereby, the information quality, granularity and horizon can substantially be improved and extended.

1. Annual budgeting

Most companies undergo an annual process during which an annual budget is established. Typically, the process focuses on financial expectations for the upcoming year. In order to quantify revenue, margins and costs, companies will roughly estimate their sales volumes and prices that are subsequently used to determine a budget Profit & Loss Account for the year.

While the process is quite essential to any business, there are some dangerous flaws to it. Often, those preparing the budget are (positively or negatively) incited to overstate or overestimate volumes and prices. A sales force may not be inclined to budget declining sales volumes. Instead, sales forces may slightly overstate volumes to a) ensure they “reserve” capacities for their customers and b) prevent anybody else from questioning their sales efforts & success. A downwards deviation during the year from budget can then still be explained by using the argument of unpredictable market changes.

2. Strategic capacity planning

Based on the annual budget, a strategic capacity plan can be outlined. If a budget shows declining sales volumes, a reduced capacity plan should be budgeted accordingly. However, with overestimation, the basis for capacity planning may not be accurate. Consequently, significant capacity will remain in the market for too long adding to the imbalance in some market sectors.

3. Sales & operations planning (S&OP)

This layer of planning intends to “plan” sales on an operational basis and align capacity to it. It is an ongoing process throughout the year with varying time horizons (typically 3-6 months rolling every month).

This sales plan is a powerful tool in any economic environment – given a certain degree of accuracy. Not only will it affect other business functions, but will also be beneficial in maximizing profitability. In strong economic environments it will help to prioritize customer orders according to profitability. In declining markets it will help to take cost cutting and cash flow improving actions.

Based on the sales plan, an operations plan can be created that includes rough production planning, inventory planning, procurement planning and a short-term R&D focus. Since S&OP ideally encompasses all supply chain related functions, it can be a strong tool to align a business to changing environments while improving supply chain efficiencies. The prerequisite for a well-functioning and beneficial S&OP process besides forecasting accuracy is a strong interaction between business functions to bundle and align the respective activities – however, many companies still lack this level of cross-departmental integration.

In addition stringent controlling of S&OP is required. It is necessary to frequently assess the current plan, to identify any deviations and to pinpoint the root causes for such divergences. As an example, during the economic downturn, well-working S&OP pro-

cesses provided early signals that demand was changing. Consequently, capacity decisions could be taken earlier

The S&OP process will ideally integrate the following elements:

- *Statistical forecasting*

Statistical forecasting will in many cases provide a good foundation for business planning. However, since it is based solely on historical data, there is a shortfall in anticipating significant changes in demand and extraordinary events, which makes manual interference necessary.

- *Manual forecasting*

Complementing statistical forecasting, it is paramount to introduce market knowledge to forecasting. With good market insight and non-biased (by positive or negative incentives) human forecasts, many events can be anticipated.

Here, the notion of collaboration along the value chain is vital: receiving information from customers on their business expectations can significantly alter own expectations - installing this channel of information will prevent or at least ease the Bullwhip Effect. However – the main prerequisite for forecasting processes to work is a high forecasting accuracy.

- *Requirements planning*

Based on the forecasts, requirements planning can take place. This includes the provision of production capacity as well as raw material and other required elements to satisfy demand.

Looking at the supplier facing elements, cooperation along the value chain is enabled. Similar to the approach on the customer side, information can be shared with suppliers to feed them information on expected demand. If suppliers are ready to compile this information and to plan their operations accordingly, they will benefit themselves and may even share such benefits with the customer.

- *Reconciliation & finalization*

Based on the three activities laid out above, a final sales & operations plan can be drawn up. This plan will not only include information on sales & production volumes, inventory levels and procurement activities but will also integrate a financial perspective on profitability and cash flow.

Benefits are significant – but so are prerequisites

Accurate forecasting and planning activities are, as most business concepts, a means to an end. They have a direct impact on two of the most important

objectives of most businesses: increasing profitability and creating a competitive edge based on increased customer satisfaction.

In times of a strong economic environment, accurate planning will enable a business to make a conscious, fact-based decision based on profitability regarding which customers and orders to prioritize and which to treat opportunistically. In times of economic decline, cost cutting measures can be taken in advance to adapt – often before competitors may do so. This creates a competitive advantage on the cost side. In addition, forecasting and planning can support more efficient production planning with direct impact on machine efficiencies, improved procurement with more accurate economic order quantities and reduce Working Capital.

Apart from the financial perspective, customer satisfaction can be improved via increased OTIF rates (on-time, in-full deliveries) using appropriate planning techniques.

As considerable as the benefits may be, they do not come without an effort. Introducing a sophisticated planning mechanism to an organization requires strong cooperation between departments, the readiness to share information within an organization as well as constant management attention and dedicated resources to drive the process.

Typically, the introduction of a planning system will start with the definition of the requirements the system should fulfill. Based on these requirements, the following needs to be defined:

- *Processes*

Any good planning practice will rely on standardized and measurable processes. These processes include customer interaction to obtain information, the three levels of forecasting and planning as laid out above, the interaction of the three levels, statistical forecasting and human input of market knowledge, transfer of information across departments as well as the definition of actions to be taken for each process step..

- *Organizational changes*

Two main aspects are important. Firstly, it is advisable to create responsibilities for the supply chain goals an organization has defined to achieve. Consequently responsibility needs to be assigned to a function in the organization to ensure a well-running forecasting & planning mechanism. Typically, one option is to create (if not already existing) the position of a Supply Chain or S&OP manager who is in charge of executing and monitoring processes, facilitating the cooperation between the various departmental functions, communicating relevant information

to senior management and ensuring alignment of business activities with regards to supply chain topics.

Secondly, a shift in mentality will be necessary. Often, departments are very much used to working in functional “silos” (production, sales, logistics etc.) – these barriers need to be eliminated to ensure benefit capture of supply chain opportunities.

- *Supporting systems*

Since a fully developed forecasting & planning process requires accurate transmission and interpretation of a considerable amount of information, supporting IT infrastructure is necessary to sustain the entire venture.

- *Incentives and controls*

As people act according to the incentives set, it is essential to define an incentive system that aligns with the overall supply chain goals and is measured via the appropriate metrics. Applying the right level of control on management level, will be a cornerstone of any implementation.

Getting a headstart

Contemplating about the introduction of a forecasting & planning process does not necessarily have to lead to a large scale, year-long implementation as the very first step. Even though integrating all facets to planning normally does take a longer period of time, the first step can simply consist of analyzing current planning efforts and identifying improvements. In virtually any company there are planning meetings taking place, some information will already be shared; some responsibilities will already be assigned. Adapting existing processes accordingly can lead to quick improvements that may help in becoming more accurate and more profitable with limited efforts. In addition, a thorough examination of processes already in place will pin point performance gaps and support definition of requirements to be fulfilled by future planning efforts. However, typically the missing piece to improvement is a structured and thorough forecasting process.

During the venture of introducing a planning process as described above it is paramount to keep the cross-functional notion of such an undertaking in mind. A functioning planning process touches on many aspects of a business – and on as many departments. Therefore, creating a collaborative approach to planning is imperative. Ideally, this kind of approach is already taken during the development phase of the project by installing cross-functional teams to work together on design, elaboration and

implementation of the planning practice. This will increase the acceptance of the new processes as well as giving the parties involved the opportunity to let their knowledge and requirements be considered in the planning process blueprint.

Achieving a competitive advantage

During the crisis, most companies had no visibility and control of all the information available and were therefore exposed even more to the impacts of the volatility. Ex post, many companies have realized that at least partial mitigation could have been possible with improved planning and forecasting capabilities and a higher transparency of available information.

Some companies have come to understand the benefits of stringent forecasting & planning efforts and have broadened their activities in this matter. In the long run, this will not only help to increase profitability and customer satisfaction but will also help to provide early signals in times of significant changes in demand.

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About StepChange Consulting

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