

eyeon

YEARS AHEAD



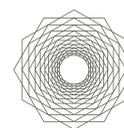
RECIPES FOR BECOMING A PLANNING CHAMPION

BUSINESS PLANNING IN THE PROCESS INDUSTRY

AN EYEON WHITE PAPER

MAY 2012

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Our special recognition goes to the members of the knowledge network for the process industry.

The white paper reflects to a large extent the findings of conferences, interviews, surveys and benchmarks with the participating companies.

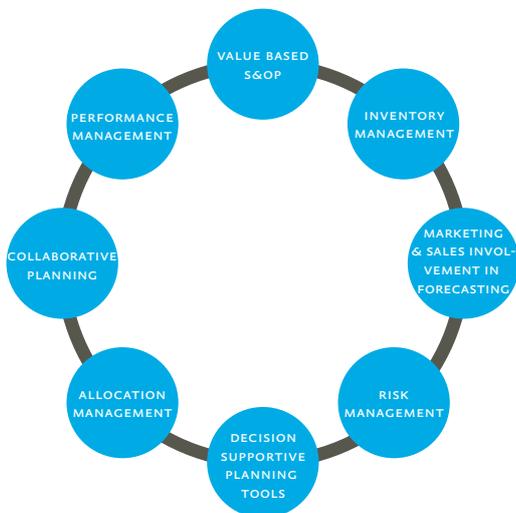
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EXECUTIVE SUMMARY

In recent years, forecasting and planning in the process industry have become ever more challenging. Companies are spending considerable time and resources improving the quality of the forecasting and planning processes and hence the quality of the output.

With this in mind EyeOn launched a knowledge network for the process industry, where companies share experiences and best practices in business planning and forecasting. Many of the network members also participated in a demand planning benchmark organized by EyeOn. Interviews within the knowledge network have yielded in-depth insights on specific forecasting and planning issues throughout the process industry.

The fact is that industry dynamics and developments on the supply and demand side put pressure on planning and forecasting in the process value chain. Understanding the need for forecasting and planning, the question is how to organize them and how to sustain a value-added process.



This white paper identifies the key issues in business planning processes: value-based S&OP, inventory management, marketing & sales involvement in forecasting, risk management, decision-supportive planning tools, allocation management, collaborative planning and performance management. During several expertise sharing events, these items were considered to be the most significant.

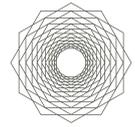
Based on these issues, interview results, literature review and the professional experience of EyeOn business consultants, this whitepaper presents 10 key principles that guide implementation of responsive forecasting and planning processes in the process industry.

Together these key recipes and best practices constitute a guide to become a planning champion.

KNOWLEDGE NETWORK MEMBERS:

Albemarle Catalysts
BASF
Bridgestone
Cargill
Clariant
Colbond
CP Kelco
Croda
DEX plastomers
Dow chemical
DSM
Eastman Chemical
Euramax
Momenive
IMCD
Ineos Nova
Kemira
Lubrizol
LyondellBasell
MCB
Momenive
Nuplex
Nyrstar
PGI Nonwovens B.V.
Philips Quartz & Special Glass
Purac
Rockwool
Sabic
Sappi Fine Paper Europe
Solutia
Stahl
Synbra Group
Teijin Aramid
Wavin
Tessenderlo Chemie
Trouw Nutrition

2 INDUSTRY DYNAMICS



1. INTRODUCTION

The EU has a strong position in the process industries, which constitute a significant proportion of its manufacturing base. The sector contributes 4% to 5% of EU GDP. Process companies often sit in the middle of wider supply chains and, as a result, traditionally perform differently from companies operating at the final consumer end of the chain.

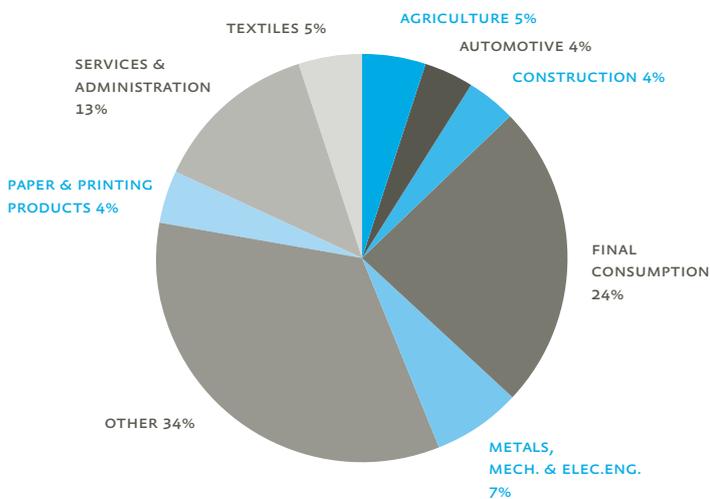


Figure 1. Indicates where the products of the Process industry end up (Source: CEFIC).

The process industry is characterized by a complex manufacturing process and scarcity of often critical base materials. In general:

- The process industry is commodity business, typically resulting in low margins. Therefore focus on cost & operational excellence is high.
- Inventory levels in the overall chain, including finished products, rise higher than in other industries compared to annual demand.
- The same applies to supply chain cycle times (defined as the elapsed time between material entering as raw material and leaving as product).
- The process industry is still affected by high bullwhip effects, because it is typically positioned at the very upstream portion of the supply chain.
- Companies lack insight into products' usage downstream and the impact on their supply chain.

Process industry supply chains, involving manufacturers, suppliers and distributors, therefore strive to improve efficiency and responsiveness. Companies in the process industry will face new challenges in the future.

Depending on the company's profile, these challenges will include:

- Globalization of supply chain capability — The global balance between cost synergies and getting closer to the market is becoming more important and will drive margin and competitive advantage, particularly with more open trading among regions.
- Industry supply/demand balance — This will be more challenging to manage due to globalization and more volatile consumption, among other things. It will be made worse by interregional trade restrictions.
- A desire to move from a product-oriented business to a service-oriented business, providing life-cycle solutions for customers.
- Mass customization and the attempt to deliver 'specialty' products at 'commodity' costs.
- The need to evaluate, report and improve sustainability and environmental and social impacts throughout the supply chain and a focus on anticipating future regulation and compliance requirements.

Access to low-cost inventory and low-cost production will still be the main driver for survival in a competitive market, but there are opportunities for companies in the process industry. Many of these opportunities may come from mergers and acquisitions, partnerships and alliances. Still other opportunities will probably be found by moving the value chain further downstream into more specialty products.

2. IMPORTANT MACRO-TRENDS THAT IMPACT THE PROCESS INDUSTRY

Natural resources and the environment

The process industry is one of the significant users of natural resources — water and crude oil in particular. It will need to re-design its production processes to reduce the use of these natural sources.

Globalization

Cash-rich government funds and companies from the Middle East and Asia are investing in Western companies to acquire knowledge and brands. One of the consequences is that the process industry is increasingly acting globally. This means longer supply chains, more foreign competitors threatening local markets.

Major shifts in consumption patterns

Geographic Shift. Today about 70% of consumer spending is concentrated in North America, Europe and Japan. But 10 years from now, about 80% of the middle-income consumers will live outside of these economies.

2 INDUSTRY DYNAMICS

Shift in End-User Choices. There is also a clear polarization of consumption in the process industry. For example, consumers can now choose between a basic, cheap wall paint or a premium one with special properties such as water resistance. For process industry supply chains, these shifts will lead to more complex and unpredictable forecasts and supply chain processes.

• Regulation

Regulation will continue to influence the development of the process industry. Growing distrust of the private sector has empowered governments to create new regulations. Differentiated and more stringent regulation will remain a disruptive factor in supply chain planning, particularly with regard to production localization and access to the market.

• Demographics

Population shifts will have major consequences. In developed countries, process industry workers are retiring, leaving companies without experienced managers to take over leadership roles. Developing countries have a high percentage of young people, but many of them need development to work in the process industry. This will impact maturity and development of competence in supply chain organizations.



Figure 2. Impact of macro-trends in the process Industry (Source: MCE Executive)

- High energy cost will compound the Middle East advantage.
- Innovation will be driven to change industry economics.
- Economic and political integration will continue requiring sector globalization to compete.
- Emergence of mass markets in developing countries will drive strong sector growth and the need to reposition asset and product portfolios.
- Government regulatory change will have localized impact.
- Environmental activist pressure may increase regulation.

- New technical resource pool will be biased toward developing countries, with talent deficit in developed regions.

3. IMPACT OF THE RECENT ECONOMIC CRISIS

The impact of the economic crisis and the consequences for supply and demand for raw materials explained in this chapter have been confirmed by the participants in EyeOn's knowledge network. To the question, 'Did the recent economic crisis severely impact your business?' an overwhelming 97% of the participants acknowledged these trends and stated the way of working would change in the period after the recent recession.

Impact on demand

Demand for the process industry has fallen globally during the economic crisis in 2009. The process industry was particularly affected by weak industrial demand at the end of 2008 and in the first half of 2009, and global production decreased considerably in 2009 (-5.4%).

DEMAND FOR THE PROCESS INDUSTRY IN 2009
REAL CHANGE COMPARED WITH PREVIOUS YEAR

WORLD	- 5.4%	
E.U.	- 12.5%	
UNITED STATES	- 6.1%	
ASIA (EX. JAPAN)	+ 5.7%	
JAPAN	- 10.9%	
SOUTH AMERICA	- 1.8%	

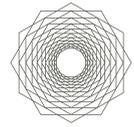
Figure 3. Impact of the economic crisis on demand in the process Industry (Source: BASF)

The drop in demand for the process industry occurred almost in parallel with lower demand in the key customer industries.



Figure 4. US retail and manufacturing sales (Source: US Census, download 25 October 2011)

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A 2009 study (J. Fransoo and M. Udenio) showed the bullwhip effect caused by the 2009 credit crisis, which was explained by the basic supply chain behaviour of consecutive companies in a value chain.

The chart above shows the difference between consumer consumption and the supply pattern of the manufacturing industry supplying these consumers. The further upstream, the bigger and more extreme these effects become. Because companies in the process industry are mostly positioned upstream in the supply chain, they are challenged with high bullwhip effects.

Impact on raw materials supply

After some volatility, raw materials prices were low at the beginning of 2009. Despite the global economic and financial crisis and the resulting low demand for raw materials, prices increased again over the course of the year.

Over the course of 2009, oil prices rose from approximately \$40 per barrel to more than \$75 per barrel. Other raw materials (such as naphtha) trended almost exactly the same as oil prices. In both the United States and Europe, energy prices initially continued to fall during 2009 before increasing again in the fourth quarter.

4. THE VALUE CHAIN IN THE PROCESS INDUSTRY

The process industry applies three main business models to create value for its customers:

- **Asset-driven players**

These explore or buy raw material such as oil/gas and turn it into semi-finished and other intermediate products. Access to raw materials is the critical success factor.

- **Integrated players**

Besides providing intermediate products, they go one step further 'downstream' in the value chain to produce other semi-finished products (such as polymers). Some of them might also have 'specialty' divisions but serve both commodity and specialty markets.

- **Specialties players**

These players buy intermediate products and basic chemicals and process them into specialty products related to specific functionalities. Some of these participants are focused on a niche market. Others are more broad-based, often directly supplying the end-consumer market or one echelon upwards in the chain, e.g. supplying the construction market.

For asset-driven companies, the critical success factors will remain access to low-cost inventory, low-cost production and supply chain excellence through globalization. Although of the elements also apply to integrated and specialty oriented players, from a supply chain and planning perspective, high flexibility towards the market, product innovation and customer intimacy will be an additional challenge for these companies. Therefore their asset base is much more agile than that of asset-driven players.



Figure 5. The value chain in the process industry

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5. FORECASTING AND BUSINESS PLANNING CONSEQUENCES

Through interviews with participants in EyeOn’s knowledge network for the process industry, we can conclude that the following dynamics are shaping supply and demand.

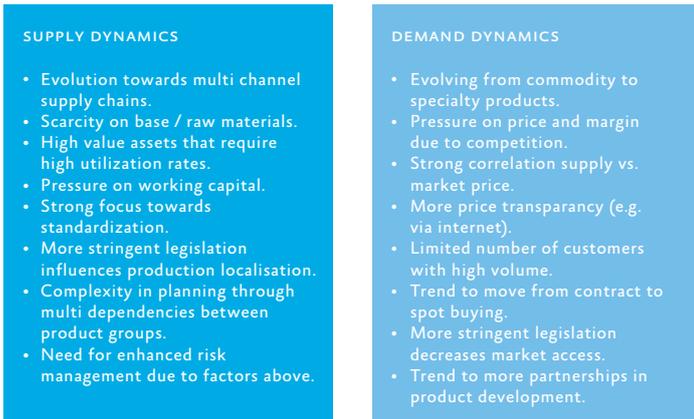


Figure 6. Summary of industry dynamics

The findings are confirmed in academic studies, which all conclude that supply and demand in the process industry are becoming more difficult to manage and predict.

Supply planning is driven by the constant search for efficient methods of gaining competitive advantage through optimal use of resources and capital deployment in a manufacturing environment that is becoming more complex and service oriented. The industry is consolidating activities due to concentration of suppliers and further globalization. Manufacturing companies are forced to rationalize and analyse risk. More demanding markets, scarcity and increased cost of raw materials and energy result in high pressure on profit margins in the process industry.

As briefly mentioned in previous chapters, companies in the process industry indeed confirm the same demand dynamics:

- Increasing scarcity of raw materials and price trends will result in price competition and more transparency. A strong correlation is developing between supply and market prices.
- Increased customer intimacy will lead to shifting consumption patterns and more dual strategies for commodities and specialties. Quite a few companies have changed from asset-driven companies to a specialty players. The typical struggle for these companies is that their assets are still commodity oriented while they are trying to serve a specialty market.
- Business will become more service oriented.
- More demand variability will be caused by spot and contract buying.
- A definite impact of legislation on demand exists already and will continue to develop.

In this changing market, the demand for individual product categories shows strong fluctuation and is difficult to predict. Many companies across the process value chain have difficulty predicting changes in their demand. If the pressure would only materialize on the demand side, delivery performance could be mastered by implementing flexible value chain solutions, by reducing manufacturing lead times or increasing supply flexibility. On the other hand, if supply is not stable but demand is highly predictable, extra buffers (inventory or capacity) can often be carried, based on accurate forecasting, without much risk of obsolescence or idle capacity.

The dynamics between delivery performance, buffer capacity and buffer stocks on the one hand, and planning and forecasting on the other, can be visualized as follows. Four air balloons are connected by tubes so that air can flow from one balloon to the other. When one balloon (e.g. delivery performance) is squeezed, the air flows to the other ones. When all three balloons at the outside are squeezed, the central balloon in the middle, i.e. forecasting and planning, has to take in all the air. On the other hand, when the central balloon of planning and forecasting is squeezed, delivery performance, buffer capacity and buffer stocks are inflated, i.e. worsened.

In the process value chain all outer balloons are squeezed (more pressure to reduce working capital and fewer possibilities to deliver customers in the way the supplier prefers). The consequence is that forecasting and planning are of eminent importance and play a pivotal role between demand and supply! This is shown in figure 7.

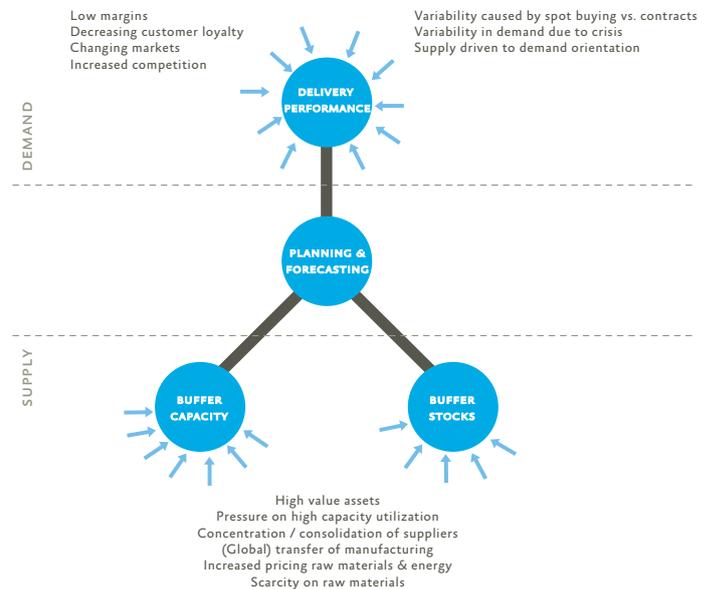
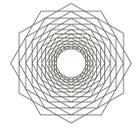


Figure 7. The increased importance of forecasting and planning



The next section outlines the key issues in forecasting and planning in the process industry.

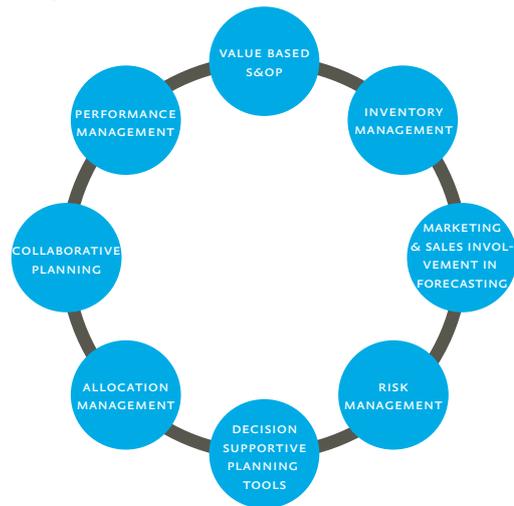
Companies in all kinds of industries recognize the need to improve their forecasting and planning processes. For today's process companies the major challenges, as described in the previous section, put extra pressure on this need: Improving forecasting and planning is vital to survival!

In this respect the position of tactical planning in the very common classification of business planning (strategic, tactical and operational planning (Gupta and Maranas, 1999)) is crucial. Decisions on the tactical horizon are related to the question of whether the company is still on track for its strategy and whether corrective (operational) actions are required (figure 8). This is related to the market trend, price trends, potential business scenarios, customer plans and resource/capacity adaptation. Tactical planning is the link between operational planning and the strategic direction. In a highly volatile market, the outcome of this process largely determines a company's success. Decisions have to be taken on resource allocations, whether new product development is working on the right products, whether the correct customers/ markets are being targeted, whether the correct capacities are installed at production sites, whether we have the correct product planned, whether this delivers the expected financial value, etc.

For many companies this critical tactical planning process is the most challenging to implement. To investigate the focus areas in the process industry, EyeOn organized a planning benchmark survey on a number of forecasting and planning topics. The participants in the process knowledge network have indicated the perceived relevance of each topic for their company (from totally irrelevant (1) to extremely relevant (5)) and indicated the current status and their vision regarding these subjects. A few topics clearly scored very high for most companies, and the list below shows these key forecasting and planning themes.

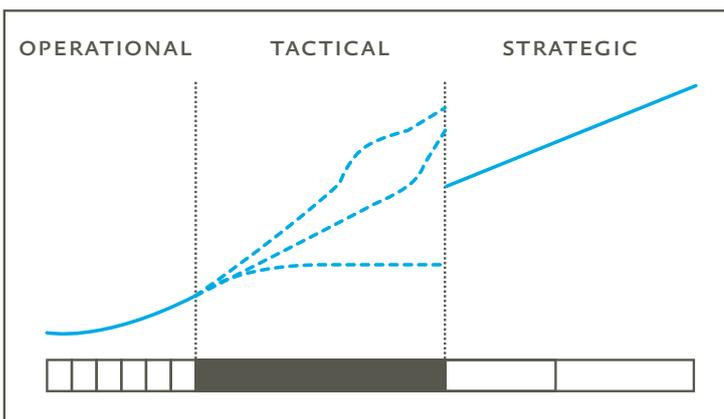
1. VALUE BASED S&OP AND ONE-NUMBER PLANNING

The participants in the EyeOn planning benchmark survey rated planning in value and one-number planning as a vital forecasting and planning topics.



Many companies are confronted with questions like: What is the optimal product mix we should push into our market in order to maximize profit? Make or buy decisions: buy a raw material or produce it ourselves? What is the optimal production recipe in an environment where raw materials prices are changing rapidly? How to maximize profit based on a fixed raw material inflow? Especially in those cases where there are a lot of dependencies between these trade-offs, well-designed S&OP process to support optimal decision-making and maximise value is required.

Companies often plan exclusively in volumes without translating forecasts in value. And who has not seen managers confronted by differences between salespeople' forecasts, logistics estimates for the future, and the annually based forecasts of the finance department?



- Accounts / markets
 - Right customers, market shares, promotions, scenario's?
- Capacity
 - Capacity utilization, actions required?
- Product development
 - Developing the right products?
- Financials
 - Does the plan deliver the agreed financial targets?

Figure 8: Tactical planning as the link between operational planning and strategic direction (Source: EyeOn)

3 KEY FORECASTING & PLANNING THEMES

In general the S&OP process needs to move away from the operational process into an integrated business process with the involvement of finance, using scenario planning and value-based instead of volume-based decisions. The benefits of 'value-based S&OP' and 'one-number planning' are clear to most people working in supply chain management. For sales and marketing, the benefits are not always clear (see figure 9), which sometimes makes implementation difficult.

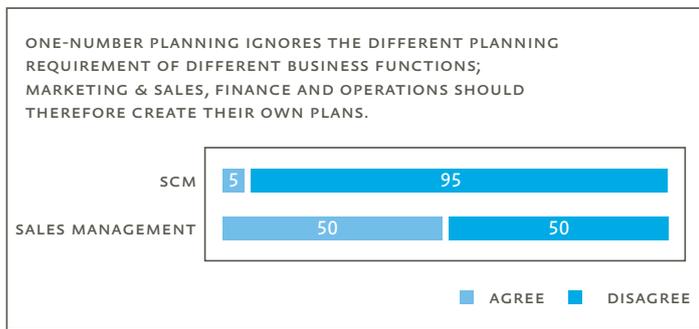


Figure 9. Different opinions between supply chain management and sales management

Alignment and improvement of strategic, tactical and operational disciplines scores high in EyeOn's planning benchmark survey. Increasing the frequency of S&OP processes was another potential area of improvement that was mentioned. Alignment of supply planning frequency and demand planning frequency is another area of attention for coping with changing market situations and managing seasonal patterns that require seasonal inventories.

2. INVENTORY MANAGEMENT

Considering the pressure on margins and the strong focus on working capital, there is a consequent and increased focus on inventory management, even after fierce, rigorous inventory reductions during the latest economic crisis. Inventory has always been the result of strategic decisions, risk evaluation and forecasting (in)accuracy. In the process, FMCG and high-tech industry, research has been done on the relationship between forecast accuracy and inventory and service levels. Figure 10 shows that forecast leaders perform better on service levels and hold significantly lower inventories.

	Laggards (accuracy <65%)	Followers (65%-80%)	Leaders (>80%)
Performance			
• Service	92%	94%	95%
• Stock (in weeks)	7.4	5.6	4.1

Figure 10. Empirical research on forecast accuracy and the impact on service level and inventory in the process, FMCG & high-tech industry

The challenge is to reduce inventory in a sustainable way without jeopardizing service levels. Since the process industry is moving into a more and more dynamic market environment, inventory management will obviously remain high on the agenda in the next decade.

3. MARKETING AND SALES INVOLVEMENT IN FORECASTING

How to involve marketing and sales in the forecasting process and how to make them take ownership of the forecast is regarded a major challenge by many of the participants. This is seen as a prerequisite to generating high-quality forecasts.

Many sales and marketing people simply do not feel that forecasting is part of their job. 'My job is selling, not forecasting,' is an often-heard statement. They are also not as familiar with ERP or other advanced forecasting systems as supply chain management is (see figure 10). This makes it even more difficult to ask sales and marketing to deliver a good forecast. And asking them to forecast on SKU-level (Stock Keeping Unit) six months ahead does not help either.

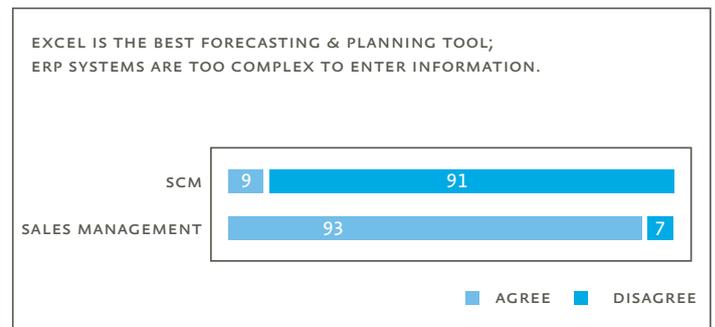
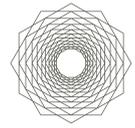


Figure 11. Different opinions between supply chain management and sales management

One participating company tries to 'force' sales to forecast, by prioritizing orders for which forecast is available. However this might lead to 'over-forecasting'. A critical success factor is to make sure the sales director is chairman of a formal 'forecast sign-off meeting'. Some companies have tied salespeople's bonuses to forecast accuracy, with positive results when it is used to stress the importance of demand planning upon startup of the process.



4. RISK MANAGEMENT

An EyeOn conference on risk management in the process industry revealed the following top 5 for risks in the process industry:

- 1.Shortage of raw materials.
- 2.Lack of reliability regarding supplier’s production capacity.
- 3.Sudden price increases of raw materials.
- 4.Sales price drops in the market due to competitive pressure.
- 5.Unforeseen changes in customer demand.

Mitigating actions are mainly focused on secondary suppliers, additional inventories and increased transparency in the supply chain.

5. DECISION-SUPPORTIVE PLANNING TOOLS

EyeOn’s planning benchmark survey showed that today a lot of Excel-based planning applications are still used at the majority of companies in the process industry. In some cases, a low supply chain complexity doesn’t require advanced planning tools, in other cases a lot of benefits can be gained example by using mathematical models to optimize supply plans. At other companies, advanced planning tools allow companies to integrate various supply plans over multiple production locations, giving integral transparency that results in significant cost reductions.

Although the use of decision-supportive tools and advanced planning tools is high on the agenda for supply chain professionals within the process industry, these tools must have added value to support S&OP processes and demand planning processes. In a highly complex and global supply chain and an industry where the financial component is crucial, implementation and use of advanced planning tools is likely to add value in the efficiency of decision-making. In any model however, the quality and efficiency of the planning process is more important than the tools used.

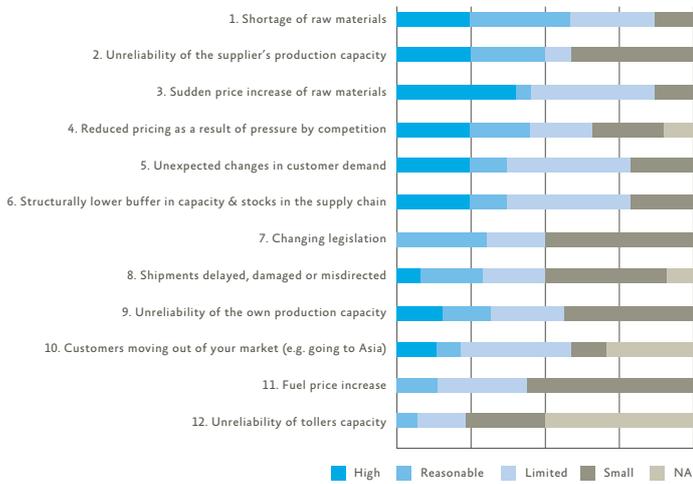


Figure 12. Main risks in the process industry (Source: EyeOn)

Although 71% of top management in the process industry recognized that risk will further increase in coming years, only 18% of the companies have fully mature risk management processes in place. Quite often, formal risk assessment processes are non-existent. Obviously this is an important challenge and area of concern. In this scenario, planning could provide part of the answers in the risk evaluation process. Figure 13 shows the overall maturity level of risk management per process step.

6. ALLOCATION MANAGEMENT

Typically within process industry, allocation management is a hot topic. As companies are dealing with high values assets it is important to utilize these assets to a maximum level. A lot of companies within the process industry run red figures in case the utilization rate drops below 80%. At the other hand the market requests a certain level of delivery performance. Producing at a high utilization rate does have a negative impact on service levels when capacity is not managed well.

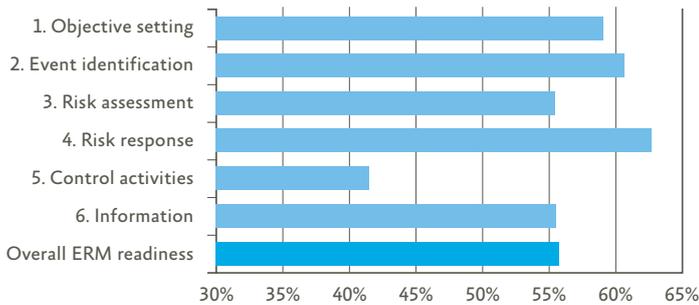


Figure 13. Maturity level of risk management per process step in the process industry. (Source: EyeOn)

Allocation management processes are installed to manage incoming orders in such a way that capacity is allocated to the high-margin and strategic customers. Only if additional capacity is available it will be allocated to less profitable customers. This requires an allocation hierarchy that allows companies to reserve capacity for strategic customers, whereby the allocation check should be part of the available-to-promise process of a customer order.

3

KEY FORECASTING & PLANNING THEMES

7. COLLABORATIVE PLANNING

From EyeOn’s benchmark survey, one can conclude that process manufacturers do not consider developing collaborative planning initiatives with customers and/or suppliers, even though there are potential benefits of process integration between process manufacturers and their suppliers and end customers. In the past, parties in the process value chain mainly had an internal focus. In the best cases, companies in the process industry had visibility on the previous and next step in the chain. More transparency and end-to-end supply chain visibility was lacking. Nowadays more companies in the process industry think about collaborative initiatives between companies. Collaborative planning is used as a basic method for external process integration. Many companies perceive collaborative planning as a means to arrive at more stable processes and achieve more stability in batch-oriented modes of production. Collaborative planning is definitely meant to secure critical materials supplies and at the same time reduce inventory levels.

8. PERFORMANCE MANAGEMENT

A closed loop of measuring key performance indicators (KPIs) for forecasting and planning, analysing root causes between reality and targets and taking actions to structurally deal with those root causes is not commonly embedded in all participating companies. Although forecast accuracy is measured in most companies, the relation with other KPI’s like service level and inventories is often not clear. Other metrics to measure the efficiency of planning and forecasting, such as process throughput time, number of judgment points and data completeness are rarely tracked over time.

An issue at many companies is how to define KPIs in such a way that they really reflect the performance of the underlying processes. For example, forecast accuracy is measured by comparing actual sales with the forecast of 1 months ago, while campaign planning results in fixed production plans over 2 months. Comparing with the forecast of two months ago would make much more sense as planning can only be adjusted after 2 months.

Many participating companies indicated that they see the knowledge network as an opportunity to benchmark themselves with peers in a comparable environment. However even for the most common performance indicator ‘forecast accuracy’, various definitions are used to measure it.

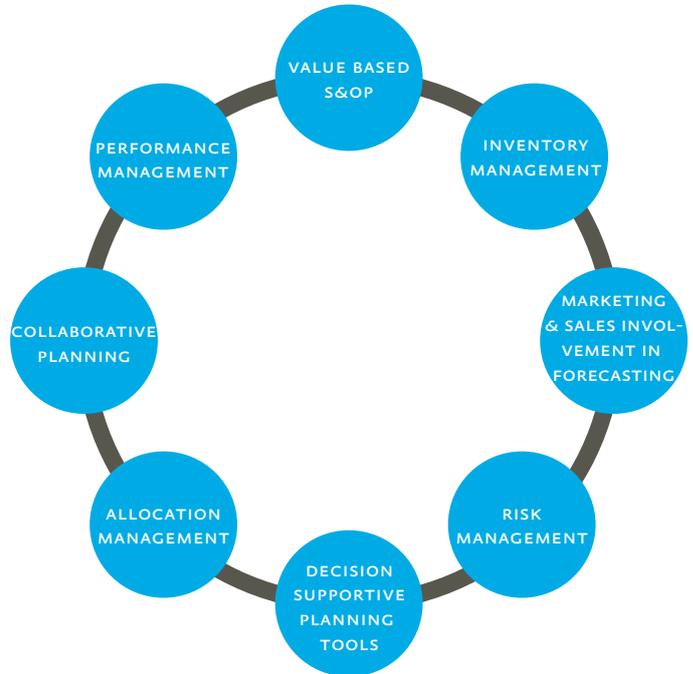
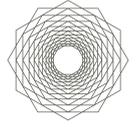


Figure 14. Key forecasting and planning themes in the process industry

In this section, 8 key forecasting and planning themes in the process industry have been discussed, based on input from members of EyeOn’s knowledge network for the process industry.

In the next section we will present 10 recipes for responsive forecasting and planning processes that facilitate improvements in each of these key areas.



RECIPES FOR BECOMING A PLANNING CHAMPION: WHAT DETERMINES RESPONSIVE FORECASTING AND PLANNING IN THE PROCESS INDUSTRY

The process value chain has to deal with the pressure on planning and forecasting due to the developments at the supply and demand side. Understanding the necessity of forecasting and planning, the question is how to organize it without installing a bureaucratic process that does not add value.

This section will touch upon some best practices related to a number of specific themes mentioned in the previous section, such as risk and allocation management. In addition, a number of best-in-class planning and forecasting principles will be addressed to drive elements like value based S&OP, performance management and getting marketing and sales involved in forecasting.

The list of principles presented here is based on the interview results, literature review and the professional experience of EyeOn business consultants. Together they form the recipes for a responsive forecasting and planning process to effectively support business decisions.

1. THE GOAL OF DEMAND FORECASTING IS NOT TO PREDICT THE FUTURE

To design a qualitatively good planning process we have to return to the basic question of why demand forecast is necessary at all. The primary objective of planning is to take accurate decisions. The process must be arranged in such a way that relevant information can be shared rapidly, efficiently and transparently within the organization (see figure 15).

Fast communication on the forecast with all parties involved to support decision-making is more important than to 'perfectly' predict the future. It is better for a forecast to be 'approximately correct' than 'exactly wrong'.

2. FOCUS: FORECAST LESS

To be able to take decisions that are important for an organization, rapid and efficient information has to be available. The level of detail depends on an organization's needs (fit for purpose).

Each company should therefore conscientiously define its 'Key Value Drivers' as the basic starting point for designing its planning process. For example, in the demand planning process, focus on those products that are produced from assets with a high utilization rate and pay less attention to products that consume capacity from a low-utilization asset. Another example is to focus on those products that require a critical raw material with a long order lead-time.

Choose the right aggregation level

Within the process industry, a clear distinction can often be made between a short-term forecast purpose and mid- to long-term forecast purpose. For the majority of the companies the primary goal for their short-term forecast is to set their inventory levels for their Make-to-Stock items and have an indication of the required raw material consumption. While the midterm forecast is more focused on determining the capacity load and taking decisions on creating seasonal inventories or search options like tolling agreements to increase capacity, in these cases there is less need to forecast at a stock-keeping-unit (SKU) level but to forecast at an aggregated product group level (e.g. a group of SKUs that require the same type of resource). Typically this gives the better opportunities to identify seasonality and trends that are difficult to identify for a single SKU.

3. USE S&OP TO STEER YOUR BUSINESS NOT JUST YOUR SUPPLY CHAIN

It's important to realize that an S&OP process is not so much a logistics oriented meeting but that it should be viewed as an integral business-planning meeting, touching every discipline in the company.

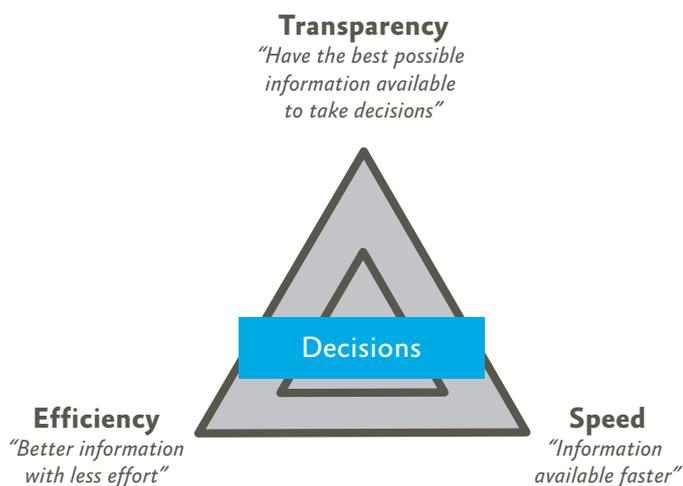


Figure 15. Forecast is about taking decisions

4 RESPONSIVE FORECASTING & PLANNING

This can only be established when the key functional planning processes are aligned into one multidisciplinary business planning process. One planning heartbeat, in terms of both volumes and value, involving all relevant functional areas with their functional responsibilities in one planning process around one set of shared targets:

- Supply chain management — responsible for supply-demand balancing, translating demand into supply, production and purchasing plans.
- Procurement — steering product availability toward market conditions.
- Marketing and sales — optimizing sales and market shares by creating and developing markets, grabbing sales opportunities and managing customer demand through pricing fluctuations.
- Finance, managing margins, profitability, returns on assets and income from operations.

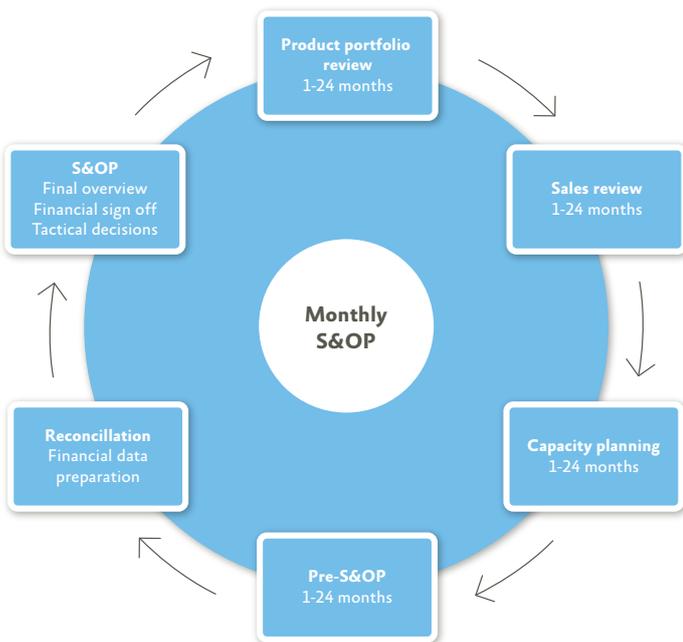


Figure 16. S&OP as an integrated business planning process

Best-in-class companies run a harmonized monthly recurring S&OP whereby monthly sales plans are checked against available capacity. Within the pre-S&OP meeting, the optimal supply plans are defined. This includes the preparation of a number of supply scenarios in case capacity is running short, whereby the impact of these scenarios on the bottom-line EBITA results should be determined. Finally, in the S&OP meeting, business decisions should be taken based on the scenarios defined in the pre-S&OP meetings. An important success factor for a good S&OP process is to have a business manager chair the meeting to enforce decisions in case of a dispute.

Quote: “ In our company we introduced the role of S&OP Manager who has an independent and functional line directly to our managing director. We consider this a pre-requisite to make our S&OP the process to steer our business rather than make it a supply chain party!”

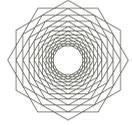
Most companies have installed an S&OP process. However, only a small portion of the companies is translating S&OP plans into financial indicators. As soon as plans are made financial, they can be compared against budget and drive gap-closing discussions. This allows business managers to review where sales volumes can be increased or where operation costs should be reduced to close the gap between current plans and budget

4. CLEAR RESPONSIBILITIES

In the demand planning process a clear distinction needs to be made between process- and forecast-quality responsibilities. Demand planners are responsible for the demand planning process, ensuring that data is provided in time and that demand planning meetings are well prepared and result in an agreed demand plan. Next to having sales validate and adjust the forecast for their business, at the end there should be one person in the sales or business organization to sign off the demand plan so that it can be used as the one-number within the S&OP process.

Within the S&OP Process, the right people should be authorized to take decisions. Participants in an S&OP meeting from different functional areas must have the authority to decide. How frequently does it happen that a decision is reversed by senior management after the meeting? The authority to take the decision should be part of the meeting. In advance, a clear insight into the boundary conditions has to be prepared, so it is clear which decisions can be taken in a pre-S&OP, S&OP and executive-S&OP meeting.

One of the network’s participants explained this is exactly what has been done within his company . During a monthly S&OP meeting which is presided by a business manager, decisions are taken for the tactical horizon. The team is made up of all relevant disciplines with the representatives authorized to take decisions. The meetings are always carefully prepared with several scenarios available for decisions that need to be taken. This avoids lengthy discussions in the meeting also making it more effective. In case of unforeseen major events such as supply disruptions the team is gathered on short term to decide on actions and to get alignment.



5. CLOSE COLLABORATION WITH YOUR STRATEGIC CUSTOMERS

Companies supplying a consumer market can rely on a large amount of end-consumer data, because their products are bought by millions of different customers. Often within the process industry, products are developed for a single or a small group of customers. It is therefore crucial to have close contact with the strategic customers to understand how demand for their products is developing and to have a second-tier view over customers further down the supply chain.

Companies need to be aware of when their customers will have their big maintenance stops planned or be involved in planning on which new products or recipe changes will be introduced into your customers' market. Often this is a phased introduction, whereby some of their customers are able to use a new product rapidly and some of their customers require more time to test a product before it can be fully implemented. This kind of information should be exchanged extensively in order to improve forecast accuracy and reduce obsolete inventory.

6. MEASURE PERFORMANCE

Like every other process, the cycle must be closed by measuring the performance of the process itself and the outcome of the process. Performance measurements are part of the process and should be evaluated on an on-going basis. Conclusions must be drawn in the to correct action plans. This ensures clarity and faith. Important to note is that forecast accuracy is not the only indicator that is important. The throughput time of the process, the number of times the forecast is modified by several functions, the number of FTEs involved in generating a forecast or planning calendar compliance is certainly as important. The measurements should measure those elements that are specifically vital for the company involved.

Efforts to improve planning forecast accuracy require investments, both human and financial, and should be approached on a return-on-investment basis. Therefore companies should first assess the impact on total business performance of certain improvements and prioritize improvement projects based on this assessment.

7. INTEGRATE MACRO-ECONOMIC DRIVERS TO FORECAST MIDTERM DEMAND

One of the challenges in demand planning for a lot of companies in the process industry is the fact that they provide products to a diversity of end-markets. In addition, because process industry companies are positioned upstream in the supply chain, all kinds

of bullwhip effects, created by the downstream parties, impact their demand.

It is important to have a good insight into the end-market that these companies are delivering and determine the drivers in their end-markets that impact their own demand. For example, a company could consider which part of their product portfolio is used for applications in construction markets. One of the drivers that 'predict' a decline or increase in demand within the construction market is the number of construction permits issued by the government. This can be integrated in statistical regression models to determine the market development of a part of the product portfolio.

Do realize that, often the macroeconomic drivers themselves are hard to predict. However, when a company is able to predict the effect of a macroeconomic driver on their specific demand, it can be used to define various demand scenarios that will be used as input for the S&OP process.

8. PLAN FOR MAXIMUM VALUE CREATION

Turnover and margins in Euros are the common language spoken by all departments within the organization. Nevertheless, a lot of companies have implemented S&OP processes that focus on volumes instead of value. Implementing S&OP is a truly integrated business planning process that requires 'talking value instead of volumes'.

Within the process industry, this is easier said than done, because supply chains are heavily integrated. For example, producing a high-margin product might result in a co-product that has a low or even negative margin.

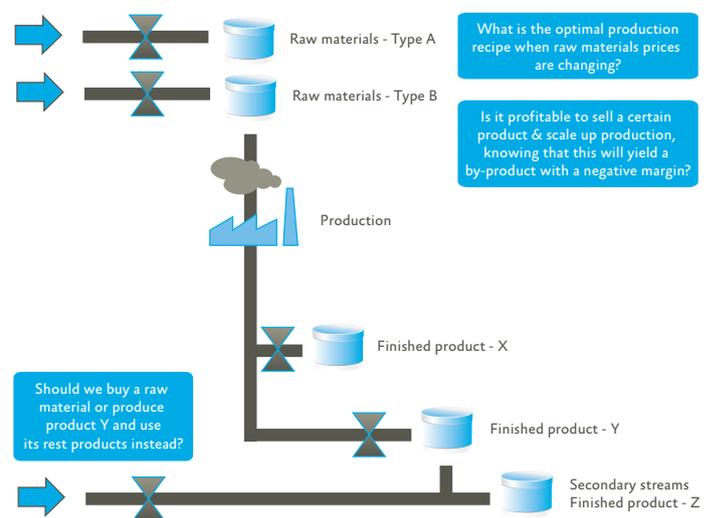


Figure 17. Typical valorisation trade-offs

4

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In these kinds of environments a valorisation model should be set up to drive an integral S&OP process:

1. Identify the supply and demand drivers that can be influenced, e.g.:
 - a. What alternative raw materials can be used and what is the impact of different recipes on the cost prices of your products.
 - b. What is the margin development when additional sales volumes are captured?
2. Identify the constraints that need to be taken into account to maximize profit. For example, the maximum storage tank capacity of a certain intermediate product could be one of the constraints to take into account.

To model the margin development we identified a number of so called 'tranches'. With our sales team we agreed that the first 100 tons of a certain product that we sell will have a margin of 20%, the second 100 tons will have a margin of 10% and as soon as we would sell more than 200 tons this would generate a negative margin.

3. Finally the supply and demand drivers together with the constraints need to be translated into an integral model. Depending on the complexity, (1) a model can be setup that allows a company to quickly run various planning scenarios and determine the maximum value creation. If the complexity is high, (2) more advanced (statistical) linear programming could be more worthwhile. This allows companies to calculate the optimal plan and run sensitivity analysis to test the robustness of the chosen plan.

9. ALLOCATION MANAGEMENT: USE IT PROPERLY

The overall goal of allocation management is to optimize profit and level service performance for different customer/market segments. Furthermore, installing an allocation management process allows a company to make use of the available resources in the most efficient way. It should reduce disruptions in the supply planning process, for example, because inventory is sold to a non-strategic customer, resulting in rescheduling activities to prevent lost sales for a strategic customer.

The level of detail of the allocation process depends on a number of factors:

- Flexibility in production and inventory capacity (e.g. can we produce products at multiple assets or not?)
- Characteristics of the production process: What are the bottlenecks that need to be managed; what is the impact of a changing product mix on the bottlenecks?

- Complexity of the market and product base: If a high number of products needs to be managed, the level of detail should be less, because the number of escalations due to allocation blocks will become too high.

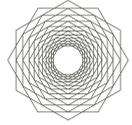
To apply allocation management, some degree of system support is necessary. Ideally the allocation check should be part of the order confirmation process. If system support is limited, allocation can be managed via some intelligent order status reporting, although this results in a reactive rather than a proactive approach. Also, when limited system support is available, the level of detail that can be achieved is low.

Quote: We often find it difficult to put some of our customers in an allocation situation based on a forecast that always has a certain level of uncertainty. Being entrepreneurial we tend to stay away from an allocation situation as long as possible but have an allocation plan available when capacity shortage might occur in the coming months.

Realize that allocation rules should provide an answer for 80% of the allocation decisions. The remaining 20% of the cases can never be captured in generic rules but should be captured through a predefined escalation path to make sure allocation decisions can be taken quickly and efficiently.

If a company is serving a sold-out market environment, allocation management is not an exception anymore but a way to optimize profit. In these businesses, a demand planner should take a predominant role in the allocation process. A demand planner should bridge decisions between sales and supply chain with regard to customer priorities in case the standard allocation rules cannot be applied.

Allocation management is an operational process that requires clear guidelines out of the S&OP process. A solution for overcoming this gap is execution teams in which feedback from the S&OP cycle is translated into operational actions and guidelines.



10. SUPPLY CHAIN RISK ANALYSIS: A MUST-DO

A structural risk management process within the supply chain is essential for participants in the process industry. Not only should supply chain be involved, but all other relevant departments also. It's good business practice to map the dependencies within the supply chain in upstream and downstream businesses. Moreover, it is not necessary to dwell on the exact impact of a risk. A relatively simple calculation of the total margin of not supplying goods multiplied by the recovery period provides sufficient insight to prioritize the various risks. Find out how the risks can be mitigated and minimized, and then continue to closely monitor the situation.



Figure 18. Supply chain risk analysis

Primary supply chain risk management goals are risk identification, risk measurement, and risk treatment. A three-step process enables a thorough understanding of every aspect of the supply chain:

- **Step 1: Risk identification**

Review your risks, prior to boiling down to key risks. Describe key risks in more detail in a cross-functional setting. The outcome of this first step is a risk map, providing insight into the probability and impact of key risks, resulting in greater risk awareness.

- **Step 2: Risk measurement**

Evaluate specific risk scenarios for selected risks and formulate recovery priorities, based on future goals, client expectations and technical recovery time. The financial exposure is presented in a comprehensive, understandable format for all departments involved (e.g. finance, operations, purchasing, sales, etc.).

- **Step 3: Risk treatment**

Lastly, risk treatment options must be evaluated and translate into contingency plans, adapted buffers, etc. Based on a robust cost-benefit analysis, allocation priorities are assigned for short- and long-term risk mitigation. As a result of this final step, risk ownership is determined to embed supply chain risk management in existing processes.

Process industry supply chains, involving manufacturers, suppliers and distributors experience increased pressure on both the demand and the supply side. Forecasting and planning is ever more important to cope with this pressure. Therefore these companies are now searching for methods to improve several aspects of their forecasting and planning process.

In this paper we have outlined 10 recipes that allow the process industry to excel and become a planning champion. The white paper covers a lot of information but is not meant to give you all the answers on how to be a champion. It provides a reality check and a sense that, armed with a plan, you can become a planning champion.

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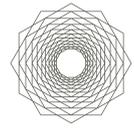
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ABOUT EYEON

In striving for success, large companies have to continuously struggle against growing internal complexity. We help our clients manage this complexity by designing, implementing and executing excellent planning processes as a discriminating factor for this success. In order to achieve this, we develop and share knowledge about top level planning and forecasting, with constantly demonstrable return on investment for our clients.

ABOUT THE PROCESS INDUSTRY PLANNING AND FORECASTING KNOWLEDGE NETWORK

EyeOn launched a knowledge network in 2009, where companies in the process industry share experiences and best practices on business planning and forecasting. Meanwhile, multiple network meeting conferences have been organized on different business planning topics, with increasing success. Many of the network members also participated in a demand planning benchmark organized by EyeOn. Besides network conferences and benchmarks, EyeOn also organizes expert sessions and master classes in specific domains of expertise in supply chain and financial planning for the process industry.

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