



Supply Chain Crystal Ball – Managing risk





Risk Factors

There is risk in almost everything we do. It is unavoidable. Supply chains are no exception facing all kinds of unexpected but inevitable surprises that can be very costly to the company.

It is imperative that the management is prepared to deal with such unfavorable incidents without building too much redundancy and increasing the cost of operations.

In a typical supply chain, having thousands of SKU's and hundreds of suppliers as well as other factors such as geopolitical challenges, labor related issues and demand volatility, make the supply chain operation very complex.

In the absence of appropriate tools, it would be almost impossible to operate it in an efficient manner. The key is to identify the potential risks before they happen so that adequate measures can be put in place.

What options do you have when the shipping company you have worked with for years goes out of business, as it happened recently? What choices do you have when the dock workers in Los Angeles go on strike, your premier subcontractor is faced with labor law violations, a major earthquake occurs where your suppliers are, or floods in Thailand destroy your suppliers' operations?

Other more frequent risk factors are, shortages of key items, single-sourced supplies, weather-related delays, Long lead-time components as well as quality issues amongst others.

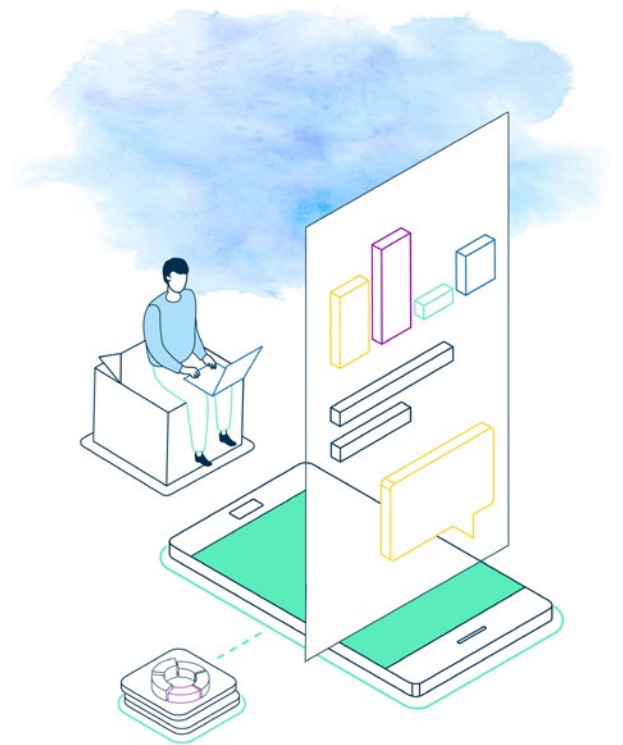
Many of the above factors cannot be controlled and when they do occur, can lead to major disruptions in the supply chain and disastrous consequences such as loss of revenue and customers.

How to protect shareholder value

Companies often try to tackle the risk issue in a static way. They examine the financial health of their suppliers and analyze their performance and strategic dependency once or twice a year. Some even go further and make sure of their compliance with the laws regarding labor and safety.

For larger companies, this is a cost that they can afford given the volume of their sales. However, for most companies, it is not always an option to look into their suppliers' operations, especially when the suppliers are much bigger than they are.

In any case, this kind of static approach, as important as it is, relies on the track record of the supplier and the past trends rather than focusing on future and how the demand patterns are expected to change in the future.



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The future trends can cause major stress points in the supply chain, on material and capacity requirements, subcontractor ability to deliver and the mix of products that are expected.

Dynamic Risk Identification and Prevention

As we all know, capacity requirement changes and bottlenecks shift dynamically with product mix and demand volume. Same happens to Risk exposure as the nature of the demand changes.

For example, one may rely more on certain supplies and suppliers or transportation systems. Thus systems are needed to dynamically identify where the highest risk exposures are as the future demand is planned.

Some of the more common risks associated with supply chains are:

- Supplier dependency and single sourcing
- Potential inventory shortages of key or high turnover items
- Shortages of long lead-time items
- Availability of substitute material
- Weather related transportation delays
- Capacity availability and overflow capacity availability
- Projected plan not in line with the expected financial plan
- Expected late deliveries to key customers

Trying to identify above potential risks on a day to day basis is not possible using spreadsheets and manual processes. As a result, many companies and planners try to mitigate risk by creating redundancies and padding inventory to be on the “safe” side.

Lack of visibility into the future, not knowing if adequate capacity and material are available and what risks lie ahead, is a huge challenge for any supply chain.

Using supply chain planning tools designed for risk management, one can dynamically examine the expected trends in the future and based on that identify where the weak points of the supply chain will be and what can be done about it.

Such analysis, when combined with simulation of disasters and Acts of God, would yield insight as to where the supply network needs to be reinforced to avoid disruptions in operations or at least mitigate the risk.

Risk Impact and Assessment

There are many ways to assess risk vs cost and reward. As an example, one can use Multi Echelon Inventory Optimization (MEIO) to assess risk of on-time delivery vs cost. This can be done by SKU and customer.



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For certain customers, the desired delivery performance must remain (say) at 98% or higher. Obviously this can be accomplished at a higher cost of inventory at different stages of the supply chain.

On the other hand, for many other customers, a delivery performance of 90% might be acceptable at much lower cost of inventory. As the demand patterns change, MEIO behaves as an almost perfect postponement strategy, to show where and when, at each stage of the supply chain, inventory is needed for a desired delivery performance and cost by customer and SKU.

This algorithmic approach, based on probability distribution and queuing theory, is by far superior to the traditional methods of historical data such as moving averages and/or min-max types of approach.

Having visibility into meeting the financial goals of the company is critical. Any risks associated with that must be detected as early as possible and addressed.

Likewise, meeting delivery performance for certain key customers, making sure that the right mix of inventory is available to keep the production running, knowing what options are available in case of capacity shortage, or material running out (or not delivered in time) are all factors that may increase delivery risks, increase cost and even cause loss of market share.

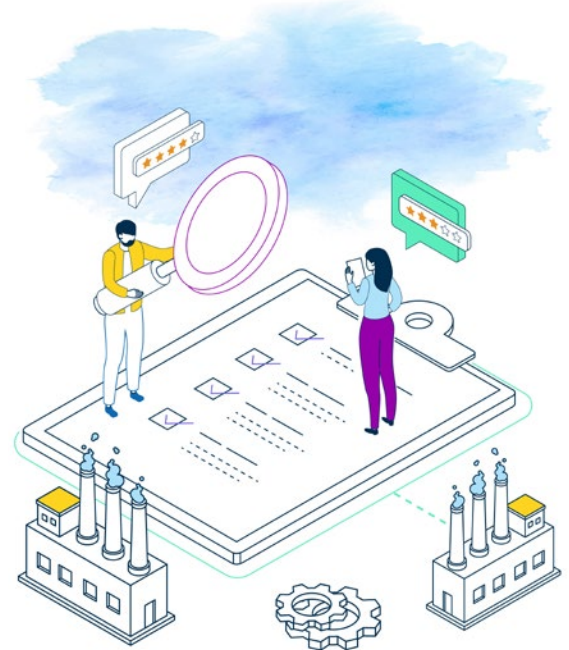
Optimization models of systems designed to assess the impact of risks can act as a crystal ball to provide visibility to the end users and furthermore provide guidelines and advise end users as to what the best course of action would be. It is a proactive way of responding to potential risks rather than reactive.

One other critical use of systems is to perform what-if stress tests on the entire supply chain. For example, by increasing demand of a certain product or region, overloading the supply chain at certain points, or trying to break certain links in the chain, one can observe the consequences of such events and what can go wrong, what the financial impact would be and what can be done from the convenience of your desk, before it happens!

Preventing such potential disasters are how modern heroes are made of in the world of leading companies!

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Let's make **accurate** plans together!



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