Agilent Technologies

Comprehensive Supply Chain Visibility Across a Multi-Enterprise Supply Chain

"Our goal is to plan effectively in the future, while ensuring that we can execute effectively in the interim."

–Hock Seng Oh
Strategic Supply Chain Consultant, Agilent

The Supplier Network and Business Environment

Agilent is the world's premier test & measurement company, offering the broadest range of innovative measurement solutions in the Electronic Test, Life Science and Chemical Analysis markets.

The company operates in a high mix, low volume environment, which drives a lot of variability in its plans. Products are typically configure-to-order with many different options.

Like other companies, outsourcing manufacturing operations is a key strategy for Agilent, which means it must navigate through volatility, while coordinating a virtual supply chain network comprised of multiple supplier and contract manufacturing (CM) partners.

In a simple supplier relationship, Agilent transmits information to suppliers through a forecast or PO, and then the supplier commits back to the PO. There is, however, a large contingency of more complicated supplier relationships to manage. Contract manufacturers (CMs), in particular, are viewed as an extension of manufacturing operations, and thus Agilent needs visibility from the CM on everything from demand and supply, to commit plans, and delivery status.

Depending on the product, Agilent has different CM models and different variations of buy-sell relationships (certain assemblies Agilent has kept in-house, which means they must sell those to its contract manufacturers in order for them to build the end item for Agilent).

Agilent collaborates with its CMs on both a planning and an execution front. From a planning perspective, the company will communicate its eighteen month forecast, and in the nearer term (2-3 months) it collaborates on more immediate operational activities and specific order requirements.

The Business Challenges

Given that Agilent has a large part of its supply chain which is external to the company, there is an increased dependency on efficient and effective supplier collaboration and end to end (E2E) supply chain visibility to enable the company's success.

One of the most difficult parts of collaboration with CMs is in understanding the total complexity of the outsourcing model. Seeing and facilitating the information flow to and from suppliers, and getting the right information fast enough for Agilent to make decisions is no easy feat.

In cases where there is a buy-sell relationship, when Agilent wants to commit to an end item order for a customer, it has to know if and when it can commit its own internal part to the CM before the CM can commit to Agilent for the final product. It is this type of complicated information loop that poses the most

challenges and drives the greatest requirement for:

- getting the right information, when it is needed
- ensuring the data is synchronized and
- making sure everyone is looking at a common view of the information.

Demand variability and market volatility add to this complexity. Because of the high variability, it is very challenging for Agilent to forecast configurations accurately so there is an urgent and continuous need to respond as fast as possible to the changing demand conditions.

A tactical exchange of data node-by-node through the supply chain is no longer sufficient to achieve a breakthrough in performance. What is required is a holistic, end-to-end planning and response management system, where everyone can understand the consequences of decisions up and down the supply chain.

Key Business Issues

- Highly configurable products and business model of high mix, low volume results in significant plan variations.
- Deep supply chain and complex sourcing relationship with internal and external partners.
- Contract manufacturing supply chain information is not in internal ERP since outsourcing. This causes "gaps" in system information flow and limits visibility and flexibility to respond faster to changes in demand and supply.
- Information is transmitted between CM systems and Agilent systems via internal tools and file transfers resulting in information latency.
- Exception handling processes are required to manage the latency and gaps in supply chain linkages to ensure high customer fulfillment, efficient processes and optimized inventory levels.

"If a demand forecast is highly accurate, 90% and above, everybody executing to the plan will produce good results. But the challenge is not that everybody can't execute to a plan, it's that they need the ability to respond to changes due to the volatility. You may have forecasted a certain item but the actual order came in with a different configuration. If the whole supply chain had executed to the original plan, you now cannot fulfill the customer order. It is in these moments that one must quickly assess the situation and ask and answer the question of 'now what happens?' "

- Hock Seng Oh
Strategic Supply Chain Consultant, Agilent

The Traditional Process

1. Agilent runs its weekly plan, generates its end-item requirements and provides a forecast to a specific CM.
2. CM loads forecast into its system (runs reports over the weekend) and comes back to Agilent for the buy-sell requirement the subsequent week.
3. Agilent loads requirement back into its system to see the result and communicates back to CM.
4. CM receives and processes this information and then provides commit date for end-item.

This process takes several weeks depending on how complex the relationship is.

Anytime there is a change, that change needs to flow through the same process; therefore, it takes several weeks before the lowest level of the supply chain receives it. And by the time they respond, things have changed again, especially considering they would be into a new monthly planning cycle.

The Challenge

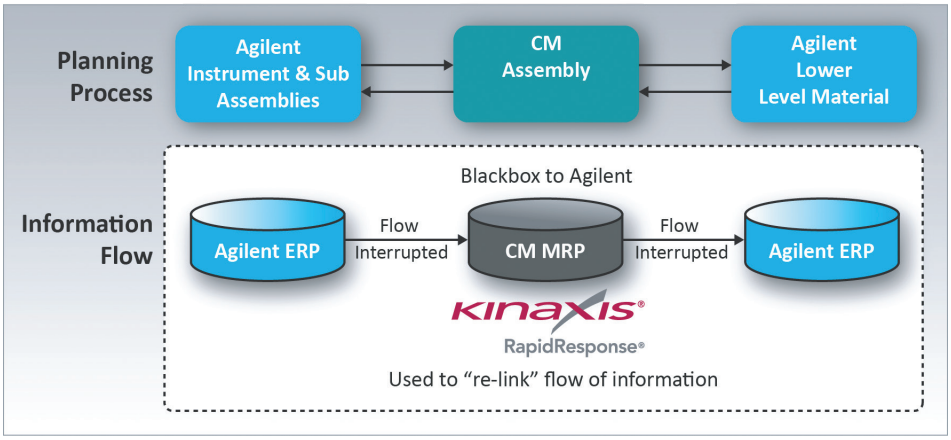
How do you flow information down fast enough so that everyone can respond to the appropriate signal as quickly as possible?

The RapidResponse® Solution

At the end of 2010, Agilent began a supply chain improvement program which included the creation of a vertically integrated planning process that would consolidate all of its different MRP and those of its CMs, to create a single plan (via BOM integration) with minimal data latency. RapidResponse is the foundational platform that merges all the information systems and provides the supporting capabilities to create and manage a single vertical supply chain. The program, which is an ongoing effort, has already produced significant advantages for Agilent.

Agilent is able to create a vertically integrated plan within RapidResponse that extends all the way from the top instrument level demand, explodes through the BOM and through all the sourcing, so the company can see the demand going through to the CM (and back through Agilent for any inter-sourcing arrangements). Agilent has created one common view where it can trace and facilitate information flow from top to bottom of the multi-enterprise supply chain — and all from within one single system.

Critical to this result was the fact that RapidResponse can model the behavior of the MRP from various CMs, because ultimately, the way a CM plans will be different depending on their process and technology. It is necessary to mimic what the CM does because the information and calculations that Agilent is working with must be consistent with what the CM's ERP is showing them.



With the vertically integrated plan in place, it becomes the backbone for all supply chain operational activities. It is, or will be, used in a variety of fashions:

- Common tool for CM management, which includes CM demand management, supply commits and performance management.
- Fast and efficient way to view and simulate supply and demand balancing scenarios to facilitate decision-making. Supports various business scenario assessments such as:
  - Impact of demand change coming down and impact of supply change going up
  - Changes in attributes; for example, if certain commodities are constrained and lead time has been stretched, what is the impact?

- New product introduction planning. Assists planners to get the supply chains set up and make sure that demand is propagating through the BOM and then through to the contract manufacturer to ensure that the CM is ready to build the product when it is transferred to them.

Ultimately, Agilent needed to have end to end supply chain visibility to understand the risks, coupled with flexible and fast simulation capabilities to understand all the constraints deep in the extended supply chain. This enables Agilent to make quicker decisions to ensure continued customer satisfaction.

What Does RapidResponse Offer?

- Provides common platform to integrate supply chain information from various sites to produce a vertically integrated MRP plan which has minimal information latency.
- Enables flexibility in modeling the behavior of MRP from various CMs in the same plan.
- Gives visibility into Agilent supply chain information at CM, such as on-hand, BOM, WIP, suppliers.
- Supports various business scenarios assessments such as impact of demand changes, supply constraints, and attributes changes in BOM.
- Confirms supply chain setups and demand propagation for NPIs.
- Provides reporting type capabilities to extract information fast and easily. Able to analyze the results to make conclusions for next steps.

Lessons Learned and Next Steps

Establishing a vertically integrated plan (and facilitating the collaboration that ensues) is a combined technology, process, and governance challenge.

The company learned that it has to have people who could trace the vertical supply chain, as opposed to the traditional way of looking at the supply chain node-by-node.

When Agilent started the integration, one of the key requirements was to have an end-state in mind. The vertical integration team did a great job linking things, providing the basic backbone of how the information should be integrated and presented. That provides the foundational starting point but efforts are ongoing to fine tune the modeling to accurately represent variations in the supply chain.

"This is a very significant paradigm shift, and organization-wise and skill-wise we are still learning and figuring out how to incorporate and change our process so that people think about and manage things vertically, versus layer by layer."

- Hock Seng Oh
Strategic Supply Chain Consultant, Agilent

The Gains

Process efficiency

- Integrated information with minimal latency, improves information flow and decision-making times

Process effectiveness

- Complete information in an easily consumable view, fast and deep simulation capabilities, and a clear understanding of all the interdependencies enables better decisions

Improved customer responsiveness and service

- Confident answers provided to customer faster

Improved business performance

- Maximize business opportunities, and minimize risks
- Profitable decisions
- Actions aligned with corporate targets

For example:

Able to reduce new (big) order assessment and commit process which ranges from 3 to 14 days to make a decision based on manually reconciled information, to immediately assessing the order and going back to the customer with a confident commit date and production plan within a day or two.

Now that the plan is modeled in RapidResponse, the implementation team is integrating the results and understanding how it impacts the process to see where either process or technology adjustments make sense.

While the willingness on the part of the CM to share key information required for MRP hasn't been an issue, there has been an information challenge in ensuring that what they share reflects operations accurately. When you link all these different operations together, there is significant work to be done in reconciling things such as part numbers, sourcing rules and the like. From a technology perspective, it isn't a roadblock, but it does require time and effort to ensure the proper linkages and conversions.

Key Challenges in Implementation

- Understanding of CM planning processes to ensure accurate MRP modeling
- CM data management (e.g. part number matching, BOM linkages, sourcing rule linkages)
- Interpretation of vertical MRP and understanding of the differences from execution plan
- Modeling of processes to support the vertical plan
- Continued governance process with contract manufacturing to ensure data accuracy

In summary, enabling E2E supply chain visibility provides Agilent with the backbone for continued efficiency and effectiveness gains. While much of the work is done on the vertical integration, continued focus will be given to fine tuning the model and expanding capabilities in the following areas:

- Expanded CM management
- Constrained scenarios assessment (capacity and materials)
- Collaborative end-of-life planning with CM

This will propel Agilent one step further to the next level of supply chain excellence.

ABOUT KINAXIS

Kinaxis delivers cloud-based S&OP and supply chain applications for discrete manufacturers and brand owners with complex supply chain networks and volatile business environments. Leaders across multiple industry verticals, including A&D, Automotive, High Tech, Industrial and Life Sciences rely on RapidResponse applications to create a foundation for concurrent planning, continuous performance monitoring, and coordinated responses to plan variances across multiple areas of the business. All founded on a single product, RapidResponse's configurable applications encompass a full spectrum of supply chain processes, including such functions as: S&OP, supply planning, capacity planning, demand planning, inventory management, MPS and order fulfillment. As a result, Kinaxis customers have replaced disparate planning and performance management tools and are realizing significant operations performance breakthroughs in planning cycles, supply chain response times and decision accuracy. From a single product, customers are able to easily model varying supply chain conditions to make both long-term and real-time demand and supply balancing decisions quickly, collaboratively, and in line with the shared business objectives of multiple stakeholders.

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