

Align Supply and Demand Planning Through Effective S&OP
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Dan Barrett: Hello ladies and gentlemen. I hope you're all enjoying today's virtual event for retailers and manufacturers. My name is Dan Barrett, I am the Worldwide Solutions Leader for IBM Cognos focusing on the Industrial Sector and Supply Chain Solutions. It's my pleasure to introduce one of our valued customers today.

Robbie Kaplan is the Director of Business Intelligence at Constar International. Today Robbie is here to discuss how aligning supply, demand and finance plans is a key challenge for manufacturers and how you can improve your organization to better meet customer demand and optimize operations. Robbie is going to share with us first hand how Constar International is using IBM Cognos S&OP solution and how it helped them improve their forecasting process and align changing customer demand with production in a multiplant environment. Then following Robbie's presentation, I am going to return to talk to you about the IBM Cognos S&OP Blueprint and give you a quick demonstration of the blueprint.

Now, let me turn it over to Robbie.

Robbie Kaplan. Thanks, Dan. Let me give you a little bit of background about Constar. Constar is headquartered in Philadelphia, Pennsylvania and it is among the world's leading suppliers of PET bottles. We have been making bottles since the 60s, and we were instrumental in the development of the two-liter PET soft drink bottle. Over time we have had technological advances and new patents and new designs in working with our customers and today you'll see our bottles in the energy drinks, in ketchup, in soft drinks, in water, in peanut butter and actually even in wine. And when you go up and touch the bottle, until you touch it you won't know that it's plastic.

Constar is a full-service packaging company. That is, we work with our customers through their new product design ideas, we develop new products and we even go out to their sites to help them run on their filling lines. Our conventional and custom PET customers are among the major brand marketers in the beverage, food, beer and flavored alcohol markets. You may never have heard of Constar, but I am willing to bet that you have either had a drink from a Constar bottle, poured some ketchup on a hamburger or fries, scooped out peanut butter or mayonnaise or used other of our products without knowing you are using a Constar product.

I am the Director of Business Intelligence. I have the primary responsibility for the design and implementation of the Cognos Planning, Cognos Finance, and Cognos 8 environments, as well as the design and implementation of our data warehouse. My background is Finance. I am originally a CPA and taught accounting at Indiana University of Pennsylvania and the University of Miami. I initially came to Constar as a consultant in 1991 to implement an ERP system and continued as a consultant to the company after their acquisition by Crown Cork and Seal through 1999. Yes, I am every company's nightmare, the consultant that never goes away. But as I learned more and

more about the company, my knowledge became valuable in the area of providing information to users so that they could make intelligent decisions. Constar was an IPO from Crown in 2002 and I came back in January of 2003.

Constar has many business challenges. As a primary supplier of PET bottles from multiple plants in the United States, our ability to provide the best cost solution depends upon our ability to combine the sales forecasts provided by our customer with our own internal information. We need to look at our production resources and the cost of production and the cost of delivery to determine the appropriate production and distribution plan. Since we distribute empty plastic containers to our customers who then fill it with product, when we ship product, we are shipping what is virtually air. So it is important that we produce at the appropriate factory.

There is seasonal demand for a significant portion of our products and that exceeds the capacity during those same months. That gives us several options. We can either produce in advance at the plant where we would like to produce; we can produce on alternative equipment at that plant, which usually implies higher cost; or we can produce at another location, which creates additional warehousing and freight cost. In addition, another challenge is that many of our products are labeled and we put the labels on and label graphics change. So we cannot produce certain products in advance. If you walked into a grocery store and you saw a soft drink bottle and it had a Christmas label on it and it was February, you probably wouldn't buy it.

Our customers are spread over wide geographic areas from the Northeast to California. Many of our customers purchase a variety of products, but many of our products are customer specific. We cannot sell a Coke bottle to a Pepsi filler or a Pepsi bottle to a Coke filler and not all our products can be made at all plants.

One of our most interesting business challenges is the concept of preform. A preform is a bottle to be. It looks like a test tube, but at the top it has the ring with a closure type that the ultimate bottle will have. These are made by us at various factories and then they are shipped to or consumed at any one of our factories, where hot air is blown into them and they take the shape of a bottle. So even though I can't sell a Coke bottle to Pepsi or a Pepsi bottle to Coke, I can use the same preform to make both a Pepsi bottle and a Coke bottle.

So where other companies are worried just about their raw material supply, we are worried about our pre-production, and so our forecast is a two-layer forecast. We forecast our bottle sales and our bottle production, and then from that we derive our preform demand, which is complicated, because many of our customers are self-manufacturers and buy the preforms instead of the bottles.

We need to constantly monitor our performance to the plans that we created and we need to spot deviations in customer behavior. Customers don't always think we need to know if they've changed their plans. They just assume if they need a bottle, it will be there. Our forecast is based on what our customers tell us. We can't impact volume except by

making a better bottle. We can't place an ad for a customer's product. We can't have a sale on a customer's product. So we are totally dependent on our customer's marketing information and on their forecasting. Our forecast is also impacted by outside drivers over which we have no control, such as the economy, weather, and oil prices.

You may be one of the people who used to after you filled your tank went into the minimarket and bought a beverage. Now, after you fill your tank, you are in shell shock and you don't go inside and buy that beverage. Weather also impacts us. If it is a particularly cold summer, people don't drink as much. And oil prices affect us in many ways, not just our freight cost, but PET is made from resin and resin is a petroleum product.

How did we get started with Cognos? When we became an independent company, we decided to implement new tools, and the first new tool we implemented was Cognos. So we moved to a Cognos platform for forecasting in January of 2003, and our first model were available for a Q3 and Q4 2003 forecast, and we enhanced their use for the 2004 Annual Plan. As the years have gone by and the Cognos product has started to include enhanced features and we've learned more about our business, we have modified our model. So the main structure has not changed, but we want to take advantage of those new features. And one of the things that we were able to take advantage of was the S&OP Blueprint from the Cognos Innovation Center, which Dan will show you later. We continued our Cognos journey by deploying ReportNet in September of 2005 and later deploying Cognos 8 and its more sophisticated reporting tool.

Our Cognos forecasting process is complex because our business is complex. It involves assumptions developed and entered by individual sales people, corporate sales administration, corporate purchasing, logistics, corporate production planning, corporate manufacturing accounting, individual plants' production planning, customer service and plan accounting personnel.

Well, with all those people involved, what's the most obvious thing we need? It's communication. It's collaborative planning and Cognos permits that collaborative planning. Each user contributes their slice of the information, which brings together the whole forecast. We begin with a customer-driven sales forecast, which is translated to a plant based and then machine based production plan, which takes into consideration constraints such as line time, inventory levels, warehouse space, and materials required, and don't forget the preform. We complete our cycle with a cost of manufacturing statement, a contribution by customer and product and a variance statement all of which are used by the Finance Department.

This is a small snapshot from our sales forecasting model. The process, as I said, begins with a sales forecast by customer and product, and the product level at which we forecast is something we called sales class. It's basically the size and shape of the bottle, and the reason we picked that level is that is the level at which revenue and costs change. It doesn't matter what label we put on the bottle. It doesn't matter if it's green or clear. It

runs at the same speed with the same mold on the same machine. So this is the level at which we forecast.

Our forecast is updated monthly for actual activity and observed trends and also by updated information provided by our customers. In helping our salesmen forecast, I don't know if you can see it on the slide, this was for the 2010 plan. In front of them while they were doing that they had the 2008 actual volumes, the 2009 actual to-date, the 2009 original plan, the 2009 latest revised forecast and some methodologies to spread the product sales on a seasonal basis based on the way the customer or the market usually purchases those products.

We then go to the production plan and those forecasted volumes by customer and product, which were entered in the Sales Forecast model, are transferred through automated links to the production planning model where they are assigned to plants by Corporate Production Planning based on the least cost, most efficient place to produce--that is the closest to the customer with available capacity to make that bottle.

The total demand by product exclusive of the customer by plant is calculated by Cognos. The plant production planners schedule this production online so that we can see if we are overselling lines. Do we have the capacity to make this? We calculate our production hours based on both our manufacturing standards and our goal speeds. This allows us to review our key constraints: line time, inventory levels and warehouse space.

This is a multi cube view of the production plan. In the latest version of Cognos, when you are doing forecasting or working in an application, you can have multiple cubes open at a time. On the one side, the longer one, you are seeing the inventory cube by product. On the upper side, on the other one, you are seeing the production plan and at the bottom you are seeing utilization. When I make a change in the production plan for that product on that line, I will see my inventory change and I will see my utilization change, so that I can see the impact of the changes I'm making in an elegant one step view.

What have been the benefits of the Cognos planning solution to Constar? It can be developed and maintained without extensive IT involvement. Constar has minimal IT support. Sometimes we think it's miniscule, unfortunately, and so we really have to control this in our Finance Department. Cognos provides a more numerically oriented environment than a database, but a more structured environment than the spreadsheet that most companies use for forecasting. It allows the sharing of information in a controlled environment. Think of all those people that I said were involved in the process. It's visible to all of them. You can also monitor workflow. You can see who is done, who hasn't started and who is done with their phase of the forecasting. It truly enables more collaborative planning and less time as required to manipulate data.

People have asked me, well, why don't you do this in your ERP? So many ERP's allow for forecasting. The problem with that is that: number one, you are polluting your ERP with unreal data. But the other thing is that with Cognos, you can plan at any level, rough cut capacity, in our case generic product, not color or label specific, or you can forecast at

the SKU level. You can forecast all significant variables and you can have flexible timeframes. You can have months, you can have weeks, you can have quarters, and you can have a combination, so that you forecast for the first four weeks coming forward followed by monthly buckets for three months, followed by quarters for the next six quarters. It also allows what if scenarios and long range planning.

What have been the benefits to us of the reporting solution? It provides users access to data in a variety of formats; reports, charts, scorecards. Users can create and maintain their own reports and queries. I taught a query class last week to my users, and within four days, I saw at least ten new reports created by my users with data that they now had access to to answer questions being asked of them.

With security you can control access to information at a variety of levels. Data from a variety of sources can be combined. And features such as bursting allows distribution of information or slices of information to appropriate individuals and groups without maintaining multiple copies of reports. Bursting breaks up a report. We have a trend report every morning that we split among the sales people based on their customers. It's one report, but it's burst to the sales people and delivered via email, so that they can look at their slice of the data. We do the same thing for the plant to see their trended sales, and in the afternoon, they get their slice of the production data. Scheduling features allow automatic distribution of data based on user needs without IT intervention.

Generally the results for Constar have been rapid dissemination of information to impacted departments. Information is not valuable if it is not actionable. So you need to get it in the hands of your users soon enough for them to make business decisions based on it. We can monitor our workflow throughout the forecasting process. We can have a constant comparison of actual to forecast at what is a meaningful level to us. We can empower users with access to information, those query reports that my users were writing last week. Our forecasting is now integrated into daily decision making processes. We have improved reporting ability and reduction of duplicate data entry. Duplicate data entry means two things; extra work and the possibility of the same number being entered as two different numbers in two different places. That's one version of the truth one set of numbers coming automatically out of the system. And we have created a self sustaining environment that allow users to determine what they need to see and when.

Dan, I'm going to hand back off to you.

Dan Barrett: Thank you, Robbie that was a great presentation, and I want to let our audience know that myself and Robbie will be available for scheduled chat in the communications lounge following this session.

Now let me share with you a little bit about the IBM Cognos S&OP Blueprint. The IBM Cognos S&OP, our Sales and Operations Planning Blueprint is built upon the Cognos total performance management framework. In that framework, it's very simple. We go to market around three primary questions in your organization, and that is, how are we doing and that's enabled through scorecarding and dashboarding. With the ability to drill

down into more detailed information and to answer the question of why enabled through reporting and more detailed multi-dimensional analysis. And of course as Robbie has mentioned, what should we be doing, the more forward-looking view in the organization around planning, budgeting, forecasting. It's critical that we sit across multiple types of data within the organization to provide those answers to those questions of how are we doing, why, and what should we be doing?

IBM Cognos has gone to market around a manufacturing performance management framework, and as you'll notice on the bottom of this slide, there is multiple types of information in the organization--sales information, customer information, supplier information and that information could be contained within operational data marts within the organization, as Robbie has mentioned, ERP systems, inventory systems, may be supply chain, third party logistics systems, customer sales, manufacturing execution systems, outside data. And IBM Cognos has been typically known for generating those business results through those scorecards, dashboards, report and analysis as we've mentioned--and even out to mobile devices through our Go! Mobile applications.

Several years ago we started developing solutions specific to industrial sector in two primary areas that we've gone to market around has been within the S&OP, our Sales and Operations Planning process, which we're focusing on today. That includes looking at demand from a sales and marketing standpoint, looking at production, constraints within the production process, and even out to distribution and fulfillment facilities, more of an operational view of the Sales and Operations Planning process.

We also have an Executive Review module that allows you to raise those operational plans to a higher level and see the effect of those supply and demand decisions and what if scenarios on an integrated set of financial plans--P&L, balance sheet and cash flow. Recently we've introduced sitting on top of these operational plans, the SCOR methodology or SCOR Metrics. SCOR stands for Supply Chain Operations Reference Model. It allows you to have visibility across all the areas within the supply chain.

So let's focus more on Sales and Operations Planning today. To give an overview of what S&OP is all about, let's just set a baseline definition. We know that supply chains are becoming more sophisticated, more decentralized, global in nature, more risk in the supply chain than ever. And the changing market conditions require us to have the kind of visibility and constant plan review that Robbie has mentioned in her presentation.

An effective S&OP process links those day-to-day operations, operational plans and financial plans to drive consensus in balancing supply and demand, and helps manage and model the effect of meeting demand with the company's strategic and operational supply chain capabilities and financial goals. It really becomes the tool for executives to manage the business.

This slide represents the S&OP process enabled by Cognos. Starting from left to right, we look at demand and supply, and we're able to analyze that demand and supply as it comes in from our source systems. Different people in the organization will review demand;

demand planners, sales, marketing, product management. And the same on the supply side, where supply chain operations people, engineering people, logistics will analyze the supply side of the actuals that are happening in the organization. They will then utilize the S&OP Blueprint to reforecast demand from a demand side and reforecast supply while linking that to the fulfillment and distribution plans to determine the ability to actually deliver that demand to the customers. This all drives to a consensus process that drives these demand and supply models to consensus. I mean out of that consensus meeting is typically an executive review that's meant to resolve issues, set the direction and determine the strategic impact of those operational decisions on the financial aspects of the organization.

The S&OP Blueprint as offered by Cognos is made up of three modules: a Baseline module that encompasses demand and production models; a Fulfillment and Distribution model; and an Executive Review model that enables that consensus building process.

The S&OP Blueprint in whole drives the reconciliation process between supply and demand forecasts. It identifies capacity, labor, supplier, material and financial obstacles to meeting that demand plan and allows you to monitor that plan on an ongoing basis using scorecards and analytics. Also it provides multiple views from a unit revenue dollars, labor hours, machine hours, who have visibility into those operational metrics within the planning process.

Let's look at the first module, the S&OP Baseline module that encompasses two models that are very tightly linked, one from a demand planning standpoint that considers sales volume and promotions to drive revenue and demand volume plans, and production model that drives capacity, cost and throughput modeling of the multiple products across multiple plants to determine the right combinations and determine if there are constraints within the manufacturing process that would inhibit the ability to meet the demand plan.

The Fulfillment and Distribution model takes feeds from the demand module and the operations or production model to drive the fulfillment and distribution constrained plan. It's more of a mid-level master planning exercise that looks at inventory targets, Distribution Center space constraints, and looks at high level distribution and transportation costs based on variable and fixed cost drivers.

The Executive Review module drives the consensus meeting and provides the ability to perform "what-if" analysis around multiple demand and supply scenarios and the linkage of those scenarios into the financial aspects of that plan through integrated P&L, balance sheet and cash flow statements. You have the ability to very quickly measure plan versus actual performance and set strategic direction within the S&OP process.

So now let's go out and take a quick view of the S&OP Blueprint in action.

We signed on to the IBM Cognos Sales and Operations Performance Portal and were immediately given visibility into those metrics and reports that support the S&OP process. In the upper right hand side, we can see a watch list of metrics that we focus on,

and how those metrics are trending, and how those metrics are performing, poorly, getting worse, performing excellent and getting better.

Other exception graphs that show us where labor shortage exceptions may be occurring within our Houston plant on a forward-looking basis. Contractor performance analysis around late shipments and average shipment days late in case we need to outsource particular production based on capacity constraints. There may be material exceptions that we would like alerting on around, again a particular demand has been placed on a production facility and the material of that has been ordered against material required.

Additional contents at our finger tips for drill down, demand consensus analysis, throughput dashboards, P&L statements for those finance folks that are involved within the S&OP process, dashboards around production and availability, supply and forecasted demand, and we will get to those in just a moment.

In addition, we have the ability to view alerts that have been generated from work flow or from tolerances exceeded within sets of data. In this case we can see that our on-time customer shipment delivery commitments have not been met, and that's also an indicative on our on-time customer shipment metric. We'll drill down into that metric. We can immediately see the historical view of this particular metric of on-time customer shipments and that it's been chronically underperforming the targets set for it.

We may want to do some additional analysis, so we'll drill down on our diagrams tab to see if we can determine what root cause analysis may be causing this. In this case we can see that on-time customer shipments are being affected by scheduled actual production. We have the ability to drill down further into the underlying metrics to determine ultimately that's really a machine utilization problem.

There may be additional analytical reports that we'd like to drill into on this metric that support this metric so that we can determine additional causes and courses for action. In this case, we have immediate view into the supply and demand dashboard and I'd like to highlight that and bring it into a larger window. We can immediately see the supply versus demand included on the same dashboard. In this case, we can see that we have a blip in forecasted demand across all regions, and that's subsequently causing the machine capacity issue across most of our plants.

In addition, a more rearview looking report on the lower left indicates that our Houston plant is not meeting its production plan compared to its volume. So in just two quick portal pages, we've seen that we have a problem in Houston. From our initial Sales and Operations Performance page, we saw that there was a labor exception within Houston and we can also see that Houston is not meeting its volume plans. Additionally, we're given linkages directly to the IBM Cognos S&OP planning templates for the demand forecast and production plan.

Let's take a quick look at the demand forecast work flow. We're provided with an alternative view of the demand forecast by smaller accounts rolling into regional areas

and larger accounts rolling into strategic accounts. We can immediately see the status of these particular plants; work in progress, not started, locked or submitted. We can also see who the owners of these plans are with multiple owners and multiple writes, edit, view, submit writes, and in addition we can also see reviewers in this planning process and their ability to submit our view-only reviewers.

We can also see a summary level order information the last time data changed, last time when these sort of textual annotations were changed and the last time the state changed, in other words, from not started to work in progressed a lot.

Within the demand forecast, we're just collecting the unit level information looking at particular promotions and how they affect those unit level demand plans and translating that into the financial aspects of that demand plan.

Let's go back to our supply and demand portal and take a link into the production plan. We're going to immediately see that we have a different view. Once the demand plan has been finished and we link that to the operations, our production model within the S&OP Blueprint. we can see that we have multiple views, again a master planning view that gives us visibility into where a master planner may allocate demand by looking at some of the constraints within the manufacturing facilities. We can also see that we have visibility into how our manufacturing facilities are participating within the planning process.

Let's drill down into the Houston plant where we know we have some labor shortage exceptions and some attainment issues. We're presented with the templates that support the S&OP production model. In this model we'll look at how we translate the demand that's been placed on this facility across three primary constrained areas, machinery or bottle necks, material plans and labor plans.

First let's take a look at the production plan to see how we've been allocated particular demand and how we go about translating that into the financial aspects of this plan, and viewing whether or not we have the capacity to make this particular production plan. In this case we can see that we've been allocated 15,000 additional units in July and we may have the ability to go in and change this assumption so that we can level out our production over a three month period. We can immediately see the effect of this on projected inventories that's indicated in a different color, our turnover averages, plant sales and other metrics associated with that.

We can also immediately see the effect of this on machinery. In case of the lifestyle products category, we can see that our plant schedule indicates that we still have the capacity utilization issue within this particular product category area--something I need to go back in and change within the statistics or maybe allocate some demand to a contractor or to a different plant. We can also have immediate view into the material plans and the demand that's been placed upon key sub components in the S&OP or in the production process. We may want to bring in additional 20,000 units of material within May so that we can alleviate a material shortage. We can also have visibility into the fact

that we still have some material shortages forecasted over the coming months and that the changes that we've made effects our material costs and our scheduled releases to the production.

Let's continue on and look at our labor plans. We saw that we had some exceptions within this and we can immediately see that shortages within June, we may need to add a second person to second shift and see if that brings us down below our threshold for [direct to let] utilization of that particular role so there is multiple roles that we could view critical positions within the facility that would inhibit our ability to make the demand that's been placed on us.

In addition, we have a visibility into the financial aspects of this plan culminating in a plant P&L with the changes indicated in red based on our changes to the plan. We can save or submit this plan back to the workflow and to indicate that we've completed our particular planning process.

So we've completed the demand forecast and consensus on demand. We've linked that to the production plan and seeing where we've had particular constraints that would keep us from meeting that demand. Now we have the ability to go in and link that directly to the distribution plans to be able to see constraints within the distribution center. In this case we have a set of templates that support the allocation of demand to distribution centers and the inbound and outbound inventory coming from those distribution centers or from the production facilities to the distribution center and to the distribution center out to the customer.

We have immediate visibility into the fact that we have exceptions within the Utah distribution center indicating that demand that's been placed on this distribution center is outstripping the level of inventory, again looking out into the S&OP planning horizon. We can also see where we have capacity issues for a particular resource--whether that resource is a machinery resource or a labor resource within a particular distribution center capturing max capacity, demonstrated capacity, and the required capacity for that particular resource and particular product family within a distribution center. We also have a very quick view into capacity exceptions within labor and machine for a particular product category and particular periods by forecast version.

Once we've completed the distribution plan, we would like to link that and drive to the consensus planning process as enabled through the executive review portal. Within the executive review portal, we've risen the metrics up to a higher level where we can immediately see particular metrics that are underperforming against plan and those metrics that are on track.

We can also see example reports around revenue attainment across business unit, channel, region how do you like to slice that information and revenue growth year-over-year across business units. Any new product revenue and a percentage of that new product revenue being forecasted within the S&OP process, any sort of capacity

utilization issues at a high level by business unit where we could drill down into that and find out exactly where we may be having capacity utilization.

What we'd like to do is go directly into the executive review template to perform some what-if analysis around this plan. Again, we are given immediate visibility into the work flow around the process of completing the executive review. In this case let's select business unit one. We're merely presented with the set of templates that support the executive review process. The executive review tab with summaries by product categories, by channel, region, breakdowns, multiple versions of current forecast versus plans versus "what-if" scenarios, breakdown by demand, signals, the resulting supply side metrics and the conversion into the financial aspects of that plan all the while linking to an integrated set of financials around income statement, balance sheet and cash flow and into a financial summary.

We can immediately see we have the ability to go in and interact with this plan. Maybe we would like to overwrite the demand by 90,000 units and how does that affect our planning metrics around cost of goods, ending inventory, whether or not we're still forecasting over capacity issues. We may need to adjust our total unit capacity to alleviate that shortage in supply and that demand that's been placed on it. We immediately then have the ability to view the effect of these changes on income statement, the effect on balance sheet and multiple cash flow methods with the financial summary that provides us with cross financial statement calculations in order to feed our targets that we saw on our executive review portal, things like gross margin, current ratio, return on assets those kind of metrics.

In summary, we started in the IBM Cognos Sales and Operations Performance Portal, we were able to quickly see exceptions across multiple data sources and drill down into the underlying exceptions on particular metrics to determine root causes. We were able then to quickly link to the demand and production plans to update our S&OP process, link that to the distribution module and drive to a consensus meeting and the executive review process, where we link our operational plans to the strategic and financial aspects of that planning process with the ability to review across the Board.

Well, I hope you enjoyed that quick presentation and overview demo of the S&OP Blueprint. There are many benefits to a best-in-class S&OP process. Even small improvements in the S&OP process can yield significant gains. In the market research study by Ventana Research, they noted that overwhelming gains in gross margin performance, better aligned financial and S&OP plans lead to overwhelming gains in margin performance, and integration of financial forecast and operational data is key to improve customer service and getting closer to the customer.

So that concludes my presentation. And the time we have left I'd like to pay a special thanks to Robbie Kaplan from Constar for joining us today. And I'd like to remind the audience that both Robbie and I will be available in the communications lounge for a scheduled chat immediately following this session. So please feel free to find us there and

we'd be happy to answer any questions you may have. Thank you very much for attending today and enjoy the rest of your afternoon.