How They Did it: Multi-Enterprise Collaboration at Intel

By John Dawson

When it came, the sign that something was wrong with one of Intel’s supply chains was not hard to miss. A key subcontractor for a particular Intel business unit was awash in excess inventory for turnkey and consigned parts. The cause? Someone had wrongly entered the required order quantity, and the subcontractor had acted on that information.

But that was simply the manifestation of the problem. The real problem was that nobody caught the problem until it was much too late—until this particular business unit (BU) owned the parts its subcontractor had unwittingly ordered. Nobody caught it because nobody knew about it. The BU had no proactive way of identifying, let alone cross-checking, appropriate purchases against actual demand. It did not have visibility.

What went wrong? That is a question those of us with supply chain responsibilities have examined at Intel reaching back at least to 2009, when my team identified a collaboration supply chain software program to address our outsourcing challenges. While putting this solution in place had to wait until a corporate-wide software initiative was well underway, rolling it out ultimately involved a broad training and certification program for supply chain.

Intel has always had superlative internal supply chain processes within its vertically integrated operations. But until recently, the same could not be said of one of its business units that outsourced to subcontractors around the world. In fact, the ad hoc nature of that unit’s supply chain interactions posed a threat to its competitiveness. Here’s how a determined team championed a powerful supply chain collaboration model that is getting real results—and that is now being rolled out across the company.
planners, buyers, and managers. Along with raising the skill level and supply chain knowledge of our team, it set the stage for the collaborative pilot program that is currently in place with our partners. What follows are the steps of how we did it at Intel.

**Setting the Stage**

First, it’s important to give some background on Intel Corp. The company is a Silicon Valley legend—a world-class developer and manufacturer of integrated circuits, notably its microprocessors and memory chips. Now almost 45 years old, Intel had revenues of close to $53 billion in 2013, with more than 107,000 employees. Intel has had a transformative impact on the world around us, making possible the first personal computers and much of the computing infrastructure that drives the Internet, as well furthering fields of significant scientific endeavor.

Throughout, the company has performed strongly, growing steadily and very profitably. It recently hit an all-time high for quarterly microprocessor unit shipments—just one hint that it has an exceptionally effective supply chain. However, that is largely an internal supply chain: Much of what the company produces is within vertically integrated operating models. There, its steadily improved business processes are supported by customized production management software to ensure extremely consistent, cost-efficient outputs. Intel’s prowess in this respect has not gone unnoticed: For 2014, the chipmaker ranked eighth in Gartner’s Supply Chain Top 25 listings (page 8).

So it’s natural to ask how any Intel BU fell afoul of the over-ordering snafu mentioned earlier. The short answer: The problem affected the supply chain of one BU that is heavily reliant on outsourcing. This particular BU makes boards and systems that support several Intel product lines. In addition, some of the new market segments that Intel is pursuing are supplied largely by trusted outsourcing partners, and with those external arrangements come significant supply chain challenges.

It’s important to state that the problem was not about outsourcing per se: Intel had been outsourcing successfully for many years. But at that time—when the chronic over-ordering incident happened—outsourcing was still a small part of the company’s overall business and had not received the focus on the levels of efficiency that had long been Intel’s internal hallmark on the silicon side of the supply chain.

Working with suppliers as far away as China, and with many of its buyers and planners in Malaysia, the Boards/Systems BU had struggled to balance customer responsiveness against asset utilization, and to juggle both of those with inventory management. Collaboration was problematic: Often, the BU’s leaders had very limited visibility of the inventory that Intel was responsible for. They depended on weekly or bi-weekly manual reports from subcontractors, and it was not always clear whether there was enough or too much inventory, so they were exposed to the worst of the bullwhip effect. Many of the BU’s supply chain processes were outdated: dependent on manual methods to update and share Excel spreadsheets, for instance. “Ad hoc” would be a kind way to describe the way in which its information supply chain ran.

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**The Push for Real Collaboration Begins**

Of course, collaborative inter-company methods were not novel: Groups such as the Voluntary Interindustry Commerce Solutions (VICS, merged into the GS1 US industry group in 2012) had long ago laid down powerful practices in collaborative planning, forecasting, and replenishment. Their methods and teachings had established best practices for everything from collaboration for distribution center replenishment to collaborative assortment planning. The ideas were well-known to experienced supply chain practitioners throughout Intel.

About four years ago, my team and I had succeeded in convincing our BU’s top managers of the need to remedy our outsourcing supply chain challenges. We had identified a collaboration software system that would be ideal. But the gears did not begin to move because Intel—long a user of enterprise ERP systems—imposed a company-wide moratorium on new software implementations, until the whole company had been re-platformed onto a more flexible and interoperable foundation of ERP enterprise...
software tools.

Time passed: For a $50 billion-a-year organization, a re-platforming initiative is anything but a weekend fix. Many of us—myself included—moved onto other roles. But my team never lost sight of the need to push for our collaboration ideal.

Our chance came in 2009. The IT organization was leading the ERP re-platforming, which incorporated industry standard ERP concepts. As part of that effort, they implemented APICS Certified Supply Chain Professional (CSCP) training for applicable IT staff members. As a long-time APICS member (I’d held many chapter board positions over the years), I knew about this program; I knew it could work well for our business users who had long been used to Intel’s heavily customized ERP systems (see Exhibit 1).

With the IT’s group’s move as a catalyst, my team and I convinced our BU’s management team that we needed to run a similar training program for our planners, buyers, and managers. The beauty of the CSCP program was that it would get our people from zero knowledge to substantial understanding in a 17-week program taught by internal instructors. We certainly understood the value of the full APICS Certified in Production and Inventory Management (CPIM) program—training in production and inventory activities within a company’s global operations that takes more than a year and comes with multiple exams—but we knew very well that we had to design and run rigorous pilot projects to prove out the concepts, determine returns on investment, figure out vendor selection, and so on.

The Boards/Systems BU was a great place to start. We knew there was an appetite for real solutions; with competition heating up and the BU’s supply chains spread worldwide, the management team was keen to have this kind of collaborative capability. They did not need much convincing about the vulnerabilities of the “as is” state: They knew the lack of supply chain visibility and limited use of analytics were acute problems where outsourcing was concerned. They saw that the collaborative capabilities needed to support outsourcing and internal manufacturing were fragmented and could not scale enough to ensure future business growth and complexity.

The BU’s operations team had also seen the effects of multiple and siloed reporting interfaces, systems, tools, and databases. They were familiar with the problems caused by the lack of data integration. With data distributed in many forms across several dozen users—much of it on Excel on individuals’ desktops—sharing of data was very difficult, and effective analysis and reporting were, well, not effective. Band-Aid offline processes were the order of the day. The management team knew they could not continue this way.

Late in 2012, we had management’s commitment—and funding—for a Collaboration, Visibility and Business Information (CVBI) program to properly pilot and test our collaborative supply chain tools and processes. We put together a use case definition and—picking up on evaluation work we had done years earlier—we quite quickly selected a vendor of collaborative software-as-a-service (SaaS). This was a significant departure: essentially running many of our critical processes in the cloud,
with the potential risks that data outside Intel's firewall might imply. But the SaaS tool came with plenty of benefits: These included “one version of the truth,” real-time, any-to-any connectivity and visibility for all participants; the opportunity for participants to self-service online; and with real ability to scale up.

By the first quarter of 2013, CVBI was off and rolling, starting with assessment and design of the pilot and on-boarding of selected subcontractors. We would pilot the program in three of the business unit’s half-dozen manufacturing sites. Our CVBI teams were coached in the “to be” state: one tool, one interface, one version of the truth, and near real-time data across the extended enterprise (see Exhibit 2).

They understood the “what:” the business objectives of increasing revenue, winning deals, ramping up faster, achieving better supply/demand balance, improving customer responsiveness, reducing inventory, increasing agility, boosting employee efficiency, and more. And they grasped the “how:” implementation of an integrated system that would become the platform for multi-enterprise collaboration execution among Intel and its subcontractors, with streamlined information flow, integrated and automated data, highlighted business exceptions, and rapid resolution processes.

We kept the teams small—roughly a dozen people representing a cross-section of the business, including planners and buyers who were our “super users.” I led the core CVBI team together with a representative manager from IT and one from the business side; we also had an executive sponsor from each side, and another from the procurement group. We would meet roughly twice a week.

By the second quarter, we began integrating those subcontractors’ supply chain data systems with our own, using the new software; configuration and testing got going in earnest too. By the fall of last year, user training was well under way, and we were getting ready to go live with the software.

**Results Achieved to Date**

Our CVBI pilot in the Boards/Systems BU has already proved itself. We’re closing up the visibility black hole. There is indeed one tool and one version of the truth out there in the cloud. We are still in the early days—the pilot is only now wrapping up—but we can already point to real business-to-business connectivity and among multiple suppliers. We now have multi-level inventory visibility across the supply network. We can do exception management, drilling down into the details. And we have “what if” analytics with which to make faster decisions. We can now get back to customers with timely answers: In some cases, we can respond inside an hour whereas this time last year, the quickest we could have done that would have been a week—a level of response that did not endear us to customers (see Exhibit 3).

None of what we’ve achieved so far has been plain sailing. Data quality has been a challenge: It has been really tough to get subcontractors in sync on this point. Some have good systems and good tools; others don’t. Many question why we need this data; they need to be persuaded that their data will be safe in the cloud. Others are concerned that we’re micromanaging them; we have to enlist Intel’s supplier relationship management experts to help those contractors understand the benefits to them of identifying supply-demand imbalances more quickly.

With many others, they are not clear what types of data we need, and in what formats; many are used to simple spreadsheets. There’s also the question of timing of the data. We have to be able to “choreograph” the data coming from multiple sources—from subcontractors, from the warehouses and DCs, from elsewhere within Intel—so our buyers and planners can make “apples to apples” comparisons. Then there are the language barriers. And, some of the subcontractors in China are so huge that we have to deal with entirely different groups, with each one like dealing with a different company. Time zones are the least of our challenges.

There have been plenty of internal challenges at Intel too. The biggest has been that CVBI is very new, and it takes time for busy people to understand what it can do. So educating the user community—buyers, planners, and others—is a big part of what we’ve been doing, and will continue to do. When we present CVBI in terms of “a day in the life of a planner,” it helps them see how they can...
be more efficient and do their jobs better. We do similar outreach for senior managers, pitching the CVBI initiative in terms of what it’s going to do for entire business unit.

We’ve run dozens of training sessions, using methods that range from conference calls and face-to-face meetings with small groups to hands-on demos of the SaaS tools. We’ve had the super users on our CVBI teams lead training—and set up and supervise “train the trainer” sessions.

One other big hurdle: getting the new SaaS vendor to understand our business requirements. That has proved to be heavy lifting. We’ve had what we call “map days” where we sit down with the vendor and take them through the detail of how we plan, how we buy, how we work with our subcontractors, and so on. That education process alone took the better part of six weeks.

Expanding the Initiative
Of course, our results to date represent only one of Intel’s many business units. And this is very much a work in progress. We still get Excel spreadsheets from subcontractors, so we still need to have people poring through those spreadsheets looking for the right inventory data. We’re moving toward the ideal of the “integrated enterprise” but we’re a ways off yet.

But what is so encouraging is that we now have a broad-based user community that is very excited about CVBI and the SaaS tool behind it. In fact, we now have more demand from more places across Intel than we have resources to handle it. There hasn’t been one big “a-ha” moment: As users start seeing valuable data coming out of the CVBI system—data and insights they hadn’t been able to get before, and in near real-time—they want more. There’s definitely a “wildfire” effect: We have a heavy concentration of our buyers and planners in Malaysia, and those in office space next to the staff who already have access to CVBI are very interested and eager.

Similar effects are happening at management levels within Intel. The general manager and the director of operations at the Boards/Systems BU are very enthusiastic about the new collaborative processes; the ops director regularly jumps on the tool himself. He sees it as a must-have: a good thing too, because he has to justify the funding for it. So the word is traveling to the heads of other business units throughout Intel.

We’re now a year into the program, but we’re looking at this being at least a three-year program. We are now beginning the process of planning a broader roll-out, using Intel’s formal transition change management processes to determine what actions we have to take, when to take them, and who will be responsible for them. Crucially, we want to template these changes: The last thing we want to do is customize the CVBI process for every business unit in Intel. Ideally, as we continue to proliferate it, CVBI becomes a standard process, much like Intel’s famed “copy exactly” manufacturing method.

Moving Forward
Intel now has the tools and methods to be able to run its external supply chain activities with efficiencies and visibility approaching those of its superlative internal supply chains. It can now blunt the risks of increasing supply chain complexity, the steep growth in the number of SKU’s, and the rising tide of competition.

The CVBI system is agnostic with regard to business unit or product; it can be scaled easily to support the quick ramp-ups that are increasingly typical of consumer-driven demand today. It helps Intel’s managers lower their exposure to inventory overages, gives them the wherewithal to run “what if” models to make faster and more accurate fact-based decisions, and makes them much more responsive to customer queries.

We’ve seen what it has done for one business unit, and look forward to seeing what it can do for Intel as a whole. Given the enthusiasm for CVBI that we’re now sensing across the company, we don’t think we will have to wait long.