

An Arena Solutions case study



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Opnext, Inc.



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Cutting Change Implementation Time 70% in an Outsourced Manufacturing Environment

INTRODUCTION

Optical network subsystem manufacturer Opnext¹ designs high performance transceivers and other module-level products for metro and regional network system providers. Some of Opnext's larger OEM customers require their products to be built to multisource agreements, which establish uniform design and production standards. Many other customers have product requirements that call for custom design. To be price-competitive, Opnext outsources manufacturing of its pluggable business unit products to a high volume contract manufacturer in China, and then drop-ships its products directly to customers.

AT A GLANCE

- **Industry:** High Technology: optical networking
- **Goal:** Increase control on outsourced manufacturing by improving product change management processes.
- **Results:** Using Arena, Opnext reduced its ECO turnaround time 70%, with the ability to process two ECOs a day instead of two a week, and avoided having to hire administrative staff to support its product line growth. Having all BOM data complete and accurate in one place for the CM reduced the communication burden by an additional five hours a week. Opnext estimated overall operational benefits enabled positive ROI in the first 6 months.

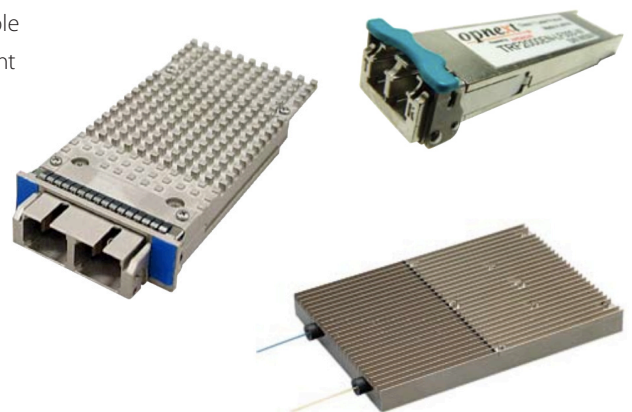
OVERSEAS CONTRACT MANUFACTURING SAVES MONEY — BUT COMES WITH CHALLENGES

With a range of different products for different customers, and new products being developed every day, Opnext was faced with the challenge of managing increasing numbers of bills of materials (BOMs) and engineering change orders (ECOs). Opnext's ability to efficiently and accurately manage BOMs and ECOs is critical to its success in delivering quality products on time and within budget. To help ensure its success, product information had to be accessible in real-time at the company's Fremont, California, location as well as at the contract manufacturing facility in China.

To help improve the accuracy, accessibility and speed of information flow between Opnext and its contract manufacturer in China, the company turned to Calvin Chou, a mechanical manufacturing engineer with many years of experience in manufacturing operations. Chou was well aware of both the benefits and challenges of outsourcing manufacturing to the Far East. "People are collaborating on the product development and introduction process from different timezones. Also, some don't necessarily speak English well. Any ambiguity around revision numbers, attachment names, descriptions of what was affected and what wasn't can lead to manufacturing mistakes and quality problems. If there were ever an area where Murphy's Law was in force, this is it." Another challenge of "long-distance" manufacturing is that it is more difficult to design the product for the manufacturing capabilities of the contract manufacturer, because some of the critical expertise is not in house anymore.²

"Instead of trying to accommodate our need for comprehensive change management within the limitations of the MRP system, I knew we needed a solution at the front end to manage the product record."

- Calvin Chou
Mechanical Manufacturing Engineer
Opnext

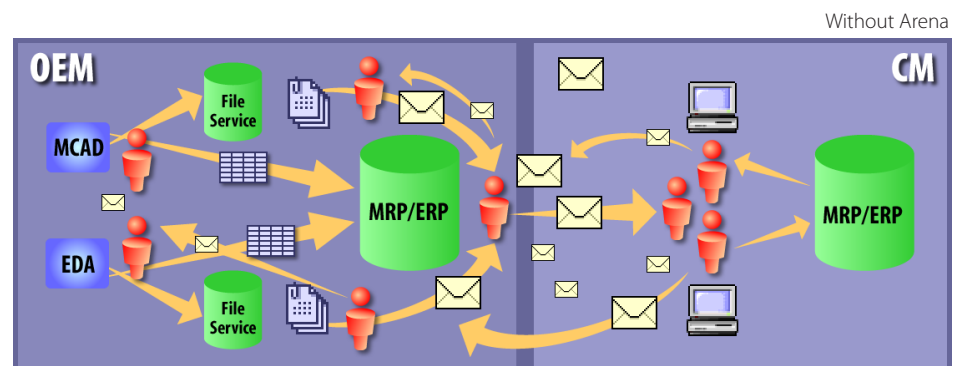


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Upon review of Opnext's product data management practices, Chou found BOMs and ECOs were being managed with spreadsheets, and changes were being communicated through email, which resulted in different versions of information being sent to multiple locations. "Managing a BOM in spreadsheets is just very, very tedious — especially if you have a large number of complex BOMs with a high percentage of common parts. Changes to a specific revision of a common part means opening and searching each spreadsheet individually, then doing a manual replace. And, there's no guarantee you didn't miss something or make a mistake." The time and effort it took to manually manage the ECO process, update the BOMs and notify the various groups that needed the information had a major impact on Opnext's ability to keep the BOMs accurate and up-to-date, and prevented its pluggables business unit from communicating changes in a timely manner to the contract manufacturer.

Opnext's inability to effectively manage the ECO process and update BOMs was a key contributor to quality problems, missed shipments, rework and scrap costs. To address the problem, Chou reviewed the company's existing materials resource planning (MRP) and enterprise resource planning (ERP) systems. When he compared what was needed to resolve the problem to what the company's MRP/ERP system provided, it was clear these systems were not designed to address that issue.

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Opnext required a solution that:

- Maintains all product definition data in one place.** All product information including item master, BOMs, specs, component datasheets, design files, test procedures and test result documents, the approved vendor list (AVL), the approved manufacturer list (AML), and estimated and preliminary quoted cost had to be maintained in one place. *The MRP system only supported the effective version of the manufacturing BOM and some vendor information.*
- Supports a comprehensive change management process,** with electronic ECOs, affected parent and child integrity validation, multiple predefined change boards (routings), material disposition information, ECO tracking, approval escalation and electronic reconciliation of all item and BOM changes. *The MRP system did not provide that level of support.*
- Tracks changes to items and BOMs with supporting markups and feedback** at any versioning point from the time the items and BOMs were created. *The MRP only maintained the effective revision of a BOM, not the entire history of superseded revisions, nor pending or working revisions. Files could not be revision-controlled directly in relationship to the item revision either.*

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- **Includes user-friendly BOM management features — like where used, global replace, BOM compare and redlines** that allow for the efficient management of a growing number of products and continuous change. *Again, the MRP did not have these productivity-enhancing features.*
- **Easily shares BOM information, including design files, in real time on a need-to-know basis** with the contract manufacturer in China. *The MRP system was accessible only inside Opnext's firewall. The workaround required downloading a BOM from the MRP system, formatting it and then emailing it. For a purchasing BOM, multiple systems had to be pulled. Large design files had to be written to CD-ROM and shipped overseas separately. This manual process was both time-consuming and prone to error.*

EXPANDING MRP/ERP WITH A COST-EFFECTIVE, COLLABORATIVE BOM AND CHANGE MANAGEMENT SOLUTION

As someone who had used PLM in a previous company, Chou first considered a client/server solution. However, Eric Guether, Opnext's director of IT, had had his own experience with client/server software and made it clear to Chou that, "[he didn't want] client-server software 'unless you carve out extra budget and give me a full-time admin. No more weekends to install fixes and upgrades.'"

Opnext had strict value-cost requirements. After evaluating a number of solutions, Opnext chose Arena for the following reasons:

Arena...

- **Provides a complete full-function solution.** Arena offers all required functionality including electronic routing capabilities that makes tracking and processing ECOs easier than ever.
- **Makes it easy to add partners and suppliers.** Unlike client/server solutions, the on-demand Arena model allows Opnext to add individual access for partners or suppliers in just minutes. And access to Arena does not require any setup or modification to the company's firewall.
- **Cuts IT support to zero.** Because Arena is provided as a web service, there's no need to install and maintain new hardware, firewalls or security systems, and no need for weekend and evening in-house IT support.
- **Is operational in days.** Instead of having a consultant take weeks to months to set up a client/server solution, Arena is operational in days.
- **Offers a cost of ownership four times lower than client/server.** Arena is offered on a subscription basis, and therefore does not require a large upfront cash outlay for hardware and software, nor allocation for IT support, as is the case with client/server solutions.

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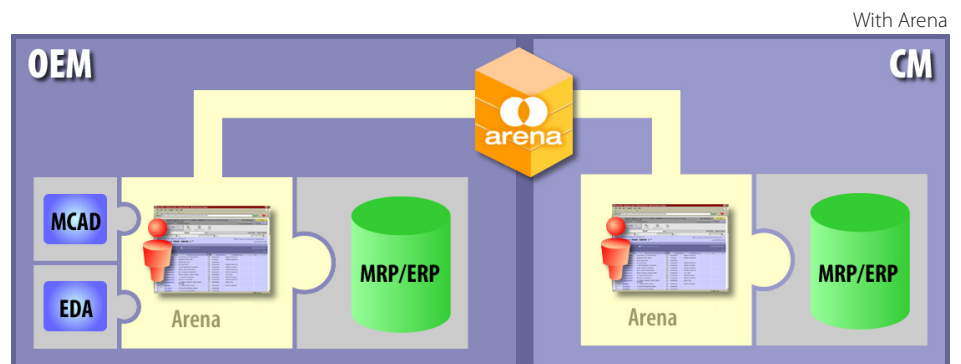
USING ARENA, PRODUCT CHANGE MANAGEMENT IS SIGNIFICANTLY IMPROVED

Today, ninety-five percent of all product definition documentation for the Opnext pluggables business unit is available in Arena. This has had a major impact on the way product information is managed, accessed and shared. Prior to Arena deployment, with product data stored on a server as spreadsheets and text files, engineers had to call or email each other to make certain they had the latest data. After deployment, product data was being updated in real time and was readily accessible to all parties through search and use of metadata. Product data search and retrieval had gone from hours a week to minutes, with the time saved being used for real-time design. Updates to parts, specs, test procedure documents, etc. were being made in Arena directly by the engineers, saving time and, more importantly, eliminating unnecessary mistakes.

Before Arena, when ECOs were drafted, printed, routed and signed manually, turnaround took two to three weeks. Occasionally, two to three weeks might turn into months if the ECO were to get buried under a pile of design documents on an engineer's desk. With the electronic ECO and routing capabilities of Arena now in place, ECOs take less than five days with full confidence that all proposed changes have been processed — a 70% improvement in change implementation time.

Updating BOMs, parts, specs and attached drawing files used to take the better part of a week. Now the engineers themselves are using Arena to specify ECO-related product data changes. After approval, changes are automatically reconciled with the effective revision of the item data. Chou, who used to process two ECOs per week, now processes two a day.

"The ability to compress the product development cycle by taking out ECO approval and implementation delays and tracking the ECOs on each individual BOM is critical. When customers send us a report on a potential defect they are experiencing in a certain lot, we need to be able to quickly identify what the BOM was and what modifications were made to the original design. Because Arena maintains the complete change history, we are able to start analyzing the customer's issue right away, rather than spending hours or days on tracking down the as-built information. Design changes can be approved and implemented in a controlled but fast manner. This responsiveness is key with regard to our overall supplier performance scorecard," says Chou.



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PROVIDING REAL-TIME VISIBILITY FOR THE CONTRACT MANUFACTURER HELPS OPNEXT CAPITALIZE ON OUTSOURCING'S BENEFITS WHILE MINIMIZING RISK

Before Arena, projects used to be transferred to the contract manufacturer through email and shipping. Literally, revised BOMs were exported from Expandable ERP into spreadsheets, combined with the AVL and emailed to the contract manufacturer with a cover sheet that explained the changes. The affected design files were written to CD-ROM and shipped separately, which could be confusing when naming conventions were not properly applied. The contract manufacturer often called to verify which revision to use. With Arena, the manufacturing BOM is always complete, with a clear redlined overview of all approved and effective changes, as well as pending changes. Not having the contract manufacturer call regarding revisions has saved Chou an additional five hours a week.

Those five hours, however, are relatively minor compared to the realized savings from not having to scrap entire batches of product as would happen when ECO turnaround was measured in weeks or months. "When a major change to a printed circuit board (PCB) was not communicated quickly enough, we would run the risk of having to scrap the entire batch of PCB and PCB A-level (i.e. passive components)," says Chou, "because rework would yield a lower quality product than the original process." With the rapid ECO approval turnaround and implementation time, these situations were greatly reduced.

With Arena, Opnext can share working revisions of its designs directly with the contract manufacturer. They are now able to invite the contract manufacturer to review proposed changes, and then keep a record of suggestions to designs and drawings in the markup section. Chou observed, "Arena has made it easier to involve our contract manufacturer earlier in the design process, making the new product introduction process a lot faster."

On the operational side of the business, Arena has brought some peace of mind as well. Steven Liu, Opnext's director of operations for the OPP business unit, paid a visit to the contract manufacturer in China and reaffirmed Arena as the only source for product data. He pointed out that should a dispute arise, the effective BOM at that time could be pulled from Arena to resolve any disputes. And with the contract manufacturer subscribed to all production data in Arena, Opnext could be confident that the contract manufacturer would be notified of any new effective revisions of parts to which there were design changes.

RETURN ON INVESTMENT CAME IN THE FIRST SIX MONTHS

With the number of active products increasing by ten times in one year, not having Arena, would have forced Opnext's pluggable business unit to hire an additional full-time document control admin just to keep up with the changes generated by the increased business. That's just one example of the savings afforded by having Arena. Opnext estimates that Arena paid for itself in the first six months. Chou adds, "Yes, Arena was definitely the right choice for our needs. We are experiencing the benefits every day, and hindsight tells me that with a solution like Arena, there is no excuse for anyone to be using spreadsheets."

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¹ Arena was originally implemented at Pine Photonics, which was later acquired by Opnext, Inc.

² See AMR Research Quote in <http://ebnews.com/story/OEG2001040650074>