Collaboration Software to Reduce Inventory and Increase Response

ABSTRACT

Some recent trends in business and manufacturing hold the promise of greater profits, yet, due to profit-robbing inventory increases, this promise has not been fully realized. [9] The major trends influencing this are:

- Globally and organizationally distributed suppliers (trading partners). [7,12]
- Globally and organizationally distributed sales channels (trading partners). [3,5,12]
- Increasing product variety and customization. [1,2,3,5,7]

In addition, due to increased business process complexity, original equipment manufacturers (OEMs) are finding the frequency of on-time fulfillment of a customer order is decreasing. [7] We describe software that maps to business models and instantly communicates information and business intelligence among trading partners. Serus software improves collaboration enabling inventory reduction, improved customer fulfillment and therefore increased profit.

Categories and Subject Descriptors

H.4.1 [**INFORMATION SYSTEMS APPLICATIONS**]: Office Automation - *Workflow management;* J.1 [**ADMINISTRATIVE DATA PROCESSING**]: - *Business;* J.7 [**COMPUTERS IN OTHER SYSTEMS**]: *Consumer products, Real time;* H.3.4 [**INFORMATION STORAGE AND RETRIEVAL**]: Systems and Software - *Distributed Systems, Information Networks;* I.2.8 [**ARTIFICIAL INTELLIGENCE**]: Problem solving, control methods and search – *Heuristic methods, Scheduling*

General Terms

Algorithms, Management, Economics, Experimentation.

Keywords

Internet, Intranet, Enterprise application software, Web-based software, Business Intelligence, Supply Chain, Demand Chain, Value Chain, Java, J2EE, 6EJB, JSP, XML.

1. INTRODUCTION

The benefits of outsourcing have been realized in many industries and at many points in a company's value chain. Within the supply chain, benefits include lowering asset holding costs, capitalizing on inventory cost reductions gained through increased buying leverage from aggregating manufacturing, and allowing OEMs to put additional focus on their core competencies of designing, marketing and selling product. On the demand chain, outsourcing has benefited the OEM as more channels of sales are opened through distributors and inventory-carrying costs are reduced. However with the inherent benefits of outsourcing comes the added complexity of managing the execution to customer commitments across this disparate, global network, over which the OEM has little direct control.

Historically all manufacturing, sales and distribution was performed from a single location or region and was wholly owned by the OEM. Expanding markets and cost pressures have resulted in today's OEMs having global demand and supply chains. [3,4,5,7,12] For the same reasons, OEMs have also entered into manufacturing, sales and distribution agreements with partner companies. [11] Competitive pressure requires OEMs to offer more products and customizable products. [2,3,5,7,9,10] The net result is that to solve these new problems, the OEMs carry more inventory, resulting in profit-robbing inventory carrying costs. [3,7,8,9,10] Also, despite higher inventory levels, OEMs find a reduction in on-time fulfillment of customer orders. [7] This unreliability causes an OEM's customers to defect to other OEMs [6] thus robbing an OEM of potential revenue, that is, lost opportunity costs. This in turn has added increased complexity to the process of outsourced manufacturing and distribution.

Recognizing these influences, Serus software maps to business models and communicates business information from the disparate, globally distributed partners virtually instantaneously and transparently. This enables OEMs to manage their manufacturing, sales and distribution as if it were under one roof. [1] We enable inventory reduction by increasing the velocity of a product through the value chain, and managing stock levels more tightly, reliably, frequently and automatically. [1,7,8,9] Proprietary algorithms enabling optimized decision making lets the OEM drive toward their overall supply chain initiatives. Serus software's goal is to enable accomplishment of responsive, lean value chains by:

- Inventory reduction through increased velocity, improved communication and automated replenishment.
- Increase ability to meet customer requests thus increasing revenue and market share by instant access to availability information and rule-based decision otpmization.

While a less tangible influence, Serus software also enables productivity improvement and fewer staff hours resulting in better and faster information. This leverages the expertise of decision makers since their time is freed from repetitive, data processing tasks.

2. REPRESENTATIVE SUCCESSFUL CUSTOMER INSTALLATIONS

Serus' successful customer installations include Quantum Corporation, VINA Technologies, Integrated Silicon Solutions, Inc. (ISSI) and Flash Electronics. Serus supports both models for supply chain management. For example, Quantum uses a make-to-forecast model, while VINA uses a build-to-order model for just-in-time manufacturing.

2.1 Quantum Corporation

Quantum Corporation chose Serus' demand side solutions to improve collaboration with their channel partners and reduce financial exposure caused by price erosion. Quantum sought a way to improve customer satisfaction by improving availability of product, but at the same time wanted the ability to react quickly as market conditions changed based on real-time demand. "The Serus application allowed us to implement inventory-reducing initiatives through a web-based application that was easy for our trading partners to use," said Mike Wais, Director, eSupply Chain group. In less than six weeks, Serus Corporation deployed its demand fulfillment solution, providing the following capabilities:

- Intelligent Replenishment
- Demand Based SKU Allocation
- Reducing Inventory Financial Exposure by 10%

2.2 VINA Technologies

VINA Technologies designs and sells highly configurable broadband telecommunications equipment to companies such as Lucent, Time-Warner, and World Comm. VINA contracts with CMs who drop ship finished goods directly to the end customer. After the first quarter of full deployment, Serus' software resulted in:

- Over 20% reduction in inventory exposure at the CM. This includes enabling the complete elimination of safety stocks loaded in the manufacturing plan.
- 90% reduction in time requirements for aggregation and analysis of the quarter's shipments and planning ratios.
- 50% faster response to customer orders.

3. CONFIGURABLE SOFTWARE

Instead of promoting a magic algorithm intended to work for all needs, when evaluating requirements we review existing public domain and internally developed algorithms and artificial intelligence and determine if, with suitable modification, they can be used to fulfill the requirement. We continue to add-on to our existing modules and add new modules this way. We also believe in offering the user choices and overrides to leverage the abilities of human experts. For example, in intelligent replenishment we offer the user a sliding scale that implements a weighted average between a forecasting algorithm and a short-term historical demand algorithm. In this way the human users always controls the business decisions with computing assistance and faster data processing. Wherever possible, the application puts the levers, rules parameters and drivers in the hands of the internal process owner as opposed to "hard coding" during deployment. The application thereby empowers the customer to drive toward their overall objectives while lowering the cost of owning the software over time and gives the flexibility to respond to changes in demand and supply.

4. TECHNOLOGY SUMMARY

The Serus technology is 100% Java/JSP/EJB running on an n-tier web server, implementing model-view-controller architecture, [14] and connected to an Oracle database. The data access objects interface with the database and send XML documents to the presentation layer. This flexible and modular architecture enables us to rapidly implement new business functions and business intelligence including customer requested modifications. Our previous deployments average 8 weeks.

5. CONCLUSION

The financial rewards of a lean, yet responsive, value chain and customer fulfillment are enormous, yet elusive. [1,2,3,5,7,8,9,10,13] In this article, we have shown our software serves as a collaboration enabler to squeeze excess inventory out of the value chain and improve the ability to satisfy customer orders.

Further information about Serus may be found at www.serus.com. This paper is an extended abstract; a longer version may be found at www-db.stanford.edu/pub/keller.

6. REFERENCES

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