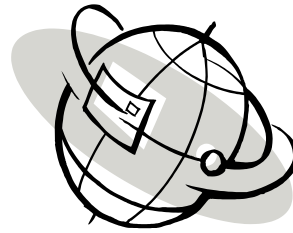


SaaS: the Final Frontier

A Long Overdue Voyage for Manufacturing Enterprises!

By Max Rayner



With Software as a Service (SaaS) gaining on traditional packages at seemingly warp speed, the most neglected sector up to now has been manufacturing enterprise software. Why has there been slower adoption of world class SaaS solutions for manufacturing than for any other enterprise domains?

The reason lies behind the complexity of manufacturing enterprise software versus other SaaS software solutions. Fundamentally more computational intensity is required to run Material Requirements Planning (MRP), Manufacturing Resource Planning (MRP II) and Execution Control (EC) than to run other applications with “lighter” computational loads such as Customer Relationship Management (CRM), Order Entry/Accounts Receivable (OE/AR), and General Ledger (GL).

Furthermore, the computational load and algorithmic complexity behind manufacturing systems has been growing due to globalization and increasingly distributed manufacturing, assembly, and inventory practices. This has further upped the ante for what is not only desired but in fact required to address the way the world manufactures today.

Starting (Almost) at the Beginning

The need for rational planning and control for production and inventory carrying costs in manufacturing are by no means new. Although initial computer capacity limits meant that real time solutions for fluctuating demand were not within sight for many decades, mainframes were successfully employed to compute batch MRP directives to Purchasing and Production Control for untold ages in the pre-internet period. Typically a weekend batch job would run to output instructions for the coming week.

In the early 1980's the MRP concept was expanded to include Execution Control (EC) and relabeled as MRP II. The additional computational load went beyond deciding what needed to be bought and whether production resources were available, to cover additional topics such as exactly timed planned availability, shop floor releases, optimization (does work order A or B make more money?) and ongoing production control checks.

A mid-range computer system of the time, for example IBM's System/38, could be tied up for over a day doing almost nothing but running MRP II and this was if it was only concerned with a single manufacturing site with all-local inventory stores, manufacturing and assembly.

Twenty years later, the world had dramatically changed but not much was new in manufacturing solutions. Advances in computer technology enabled additional computational load for more complex manufacturing requirements such as global sourcing within the same company and contract manufacturing across companies, but not even Moore's law had brought about enough improvement to MRP II. A sufficiently large global enterprise with multiple manufacturing sites, warehouses, and contract assembly partners could expect MRP II to be complex enough that not even a fully loaded E-10K from Sun Microsystems could handle it overnight.

True enough, global networking advances meant that different facilities no longer had to fax inventory positions and orders around the world, and the advent of Web 1.0 had "connected" the supply chain so that the real time needs of customers were easier to discern. But too often their solution required a massive computational platform to be handled with extreme care. At this point the information was finally available for real time manufacturing but the complex computational requirements for MRP II still posed a challenge. This pain was particularly obvious to small and medium sized (SMB's) manufacturers who did not have the resources to dedicate a quasi-mainframe like an E-10K to these tasks.

SaaS and Web 2.0

It has not been at all surprising that the SaaS revolution took on less difficult solution areas at first. CRM, OE/AR, GL have proven far easier to implement on SaaS platforms given that their relatively shallow and atomic transactions have two important consequences:

- ✚ Load can be averaged over multiple SaaS clients and their individual users.
- ✚ The in-memory requirements do not involve intense computations.

Leaders in SaaS such as Salesforce.com, NetSuite and others have taken brilliant advantage of those relatively light computational loads to offer over-the-Web, high quality alternatives to traditional software packages. In many cases not only are they just as good, in fact they are vastly superior to installed packages at several levels:

- ✚ Having been designed from the start for location-agnostic access, they are far easier to use for truly distributed global enterprises and their partner eco-systems.
- ✚ By virtue of running on shared environments, capital and service delivery costs are amortized over multiple clients and a superior experience can in effect be delivered for less upfront costs and less costs overall.

Meanwhile (one could say in a different galaxy) other key SaaS leaders such as Amazon, Google, and hosting providers such as Rackspace and ServePath also made in-roads to facilitate the emergence of many other SaaS applications. Services such as Amazon Web Services, Rackspace Cloud, ServePath's GoGrid, and Google Apps have allowed transitions from traditional software to SaaS solutions in a variety of ways.

Missing from all this great progress had been the last frontier – the ability to get a SaaS solution for the massive memory, computational, and interconnected problems around such areas as MRP II and beyond.

Enter a “Singularity”: Rootstock Software® and (Finally) Moore’s Law

Until now, two main limitations had prevented a world-class solution for the needs discrete manufacturers:

- ✚ Lack of domain knowledge among those involved in the SaaS revolution.
- ✚ Insufficient capability in the cheap-off-the-shelf infrastructure components that would make a truly affordable SaaS solution for manufacturing available.

The profound management and computational issues around production costs, inventory holding costs, fluctuating demand and execution control are not the kind of thing that one masters without decades of actual nail-breaking working and experience.

Even to this day, debate continues around whether modern MRP II requirements have outstripped previous heuristics-based solutions and whether for maximum optimization they now require all the toolset around dynamic programming -- including linear programming, probabilistic demand and inventory models, and problem chunking techniques that have lately come to Web 2.0 fame such as Google’s MapReduce.

While matters around internet user interfaces can be left to a “try it and if they like it keep it” way of thinking, the control of an enterprise’s inventory and execution control does not leave room for trial and error.

So it is in some ways not surprising that only a team with deep experience behind them such as Rootstock could credibly put together a successful SaaS solution. The Rootstock team couples together decades of manufacturing domain experience and technical expertise to produce a robust and scalable SaaS solution for manufacturing.

On a related front, cheap 64 bit systems have finally opened the door for architectures that provide sufficient memory and computational power so that what used to take a dedicated mainframe can finally be done as an SaaS service. In fact, infrastructure and computational technique advances not only allow a SaaS solution for discrete manufacturers, but make it practical to offer with all the advantages of the first generation SaaS solutions:

- ✚ Having been designed from the start for location-agnostic access, Rootstock Software® solutions are easy to use for truly distributed global enterprises and their partner eco-systems.
- ✚ By virtue of running on shared environments, capital and service delivery costs are amortized over multiple clients and a superior experience can in effect be delivered for less upfront costs and less costs overall.

So it’s with a degree of delight that I extend an invitation to any who have been skeptics up to now -- boldly go where no man [or woman] has gone before. Learn more about how Rootstock Software® finally delivers both the industry expertise and technical platform to successfully delivery a truly robust SaaS manufacturing solution. You will be surprised by what the Universe has finally cooked up... manufacturing excellence within a SaaS solution!

About the Author

Max Rayner is currently Chief Technology Officer at Travelzoo Inc., the largest publisher of travel deals on the Internet, where he led the creation of Fly.com, a leading travel meta-search engine. Mr. Rayner cut his teeth in manufacturing systems at Allied Signal in the 1980s, in financial control for Xerox's Microelectronics manufacturing in the 1990s, and running corporate infrastructure including application delivery for Sun Microsystems in the early 2000s. He joined the SaaS revolution as Vice President of Systems Architecture for Salesforce.com, where he led systems architecture and product/platform re-engineering to future-proof the on-demand CRM leader which created infrastructure capable of over 100,000,000 transactions/day at an average of 250 milliseconds/transaction. Prior to Travelzoo he was Executive Vice President of Products and Services at SurfControl plc, where he led the transformation of SurfControl plc's products and technical infrastructure from primary dependence on on-premise software to a portfolio including truly global on-demand information security solutions. Mr. Rayner is a member of Rootstock Software®'s Advisory Committee, a group of leading industry figures bringing vision, drive, and commitment to deliver the leading SaaS manufacturing enterprise software serving Small and Medium Enterprise (SME) discrete manufacturers.

About Rootstock Software®

Rootstock Software® is the leading Software as a Service (SaaS) provider of manufacturing enterprise software serving discrete manufacturers in the mid-market. Rootstock Software® was launched in 2008 in response to the growing need for an SaaS solution to cut costs, improve processes, and drive revenues for mid-market manufacturers. For more information, please visit <http://www.rootstocksoftware.com> .