

The Lean Approach to Materials Planning and Procurement

1-Is a Materials Requirement Planning (MRP) System the best approach for your company?

Of course an MRP system has to be an ideal system for your organization after all most companies are using it, right? Or is it? Let's examine the facts surrounding how effective an MRP system really is. ...

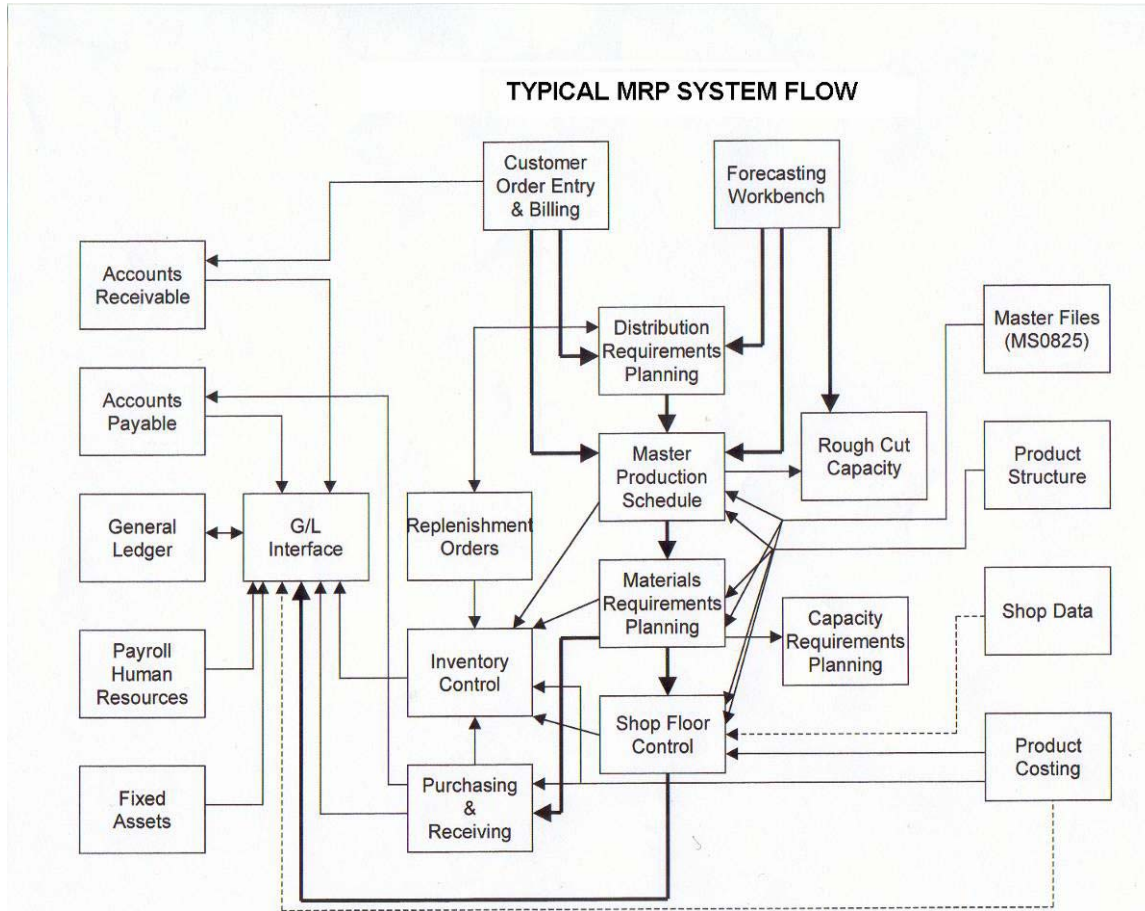
An MRP system is used to plan and buy material to a forecast or to a job order and virtually all of the manufacturing companies within the United States are currently using some form of an MRP system. An MRP system is perceived as a required system to drive an organization. The actual procurement cost of an MRP system can range from \$50,000 to \$3 Million plus the annual ongoing software maintenance fees. The number of dedicated staff required to maintain the integrity and accuracy of the system is staggering. Your organization should add up the staff required to maintain the critical information within the system. You must consider the Administrative Overhead required to support the constant communication to suppliers setting scheduled delivery dates of raw materials, the Engineering Overhead required to accurately create Routings, the Production Planning Staff maintaining the Master Schedule and scheduling the Jobs on the production floor, the Operations Team tracking the movement of jobs, posting to labor, to work centers and to completed routing operations. Let's account for the Stock Room personnel required to perform inventory cycle counts and fill pick lists for a build. Constant diligence is required by all these departments to properly enter data to assure proper delivery of raw materials at the time of build. Now consider the inevitable "Rescheduling Event" and impact on the organization to move in/out delivery dates of raw materials. Also the impact of changes to the Mater Schedule requiring Production Planners to change the Job Order priorities and reverse inventory transactions. These are a few of the many requirements draining your staff to maintain an MRP system.

The MRP system has become a huge resource-draining monster whose data integrity is essential for proper operation. Many companies have achieved a respectable On Time Deliveries (OTD) of 95% or better with inventory turns of 8 times or more but it is the result of a very large highly skilled staff diligently executing complex transactions. Naturally with all the transactions required for the MRP system, it is inevitable that a transaction error will occur and result in a disruption of the system and missed ship dates. This is of course not acceptable but the **system** is used as an excuse and the scapegoat.

You should review the success of our world competitor, the Japanese. They flooded our country with quality products at an affordable price. The affordable prices are not the result of cheap labor, they are the result of using a different manufacturing method than the traditional MRP system. Isn't it time that we explore a different manufacturing method?

The typical MRP system pictured below in Figure 1 illustrates the complexity and overhead required to maintain an MRP system. There are 40 transactions in a typical MRP flow vs. 11 transactions in a Lean Purchasing and Planning flow as shown in Figure 2.

FIGURE 1

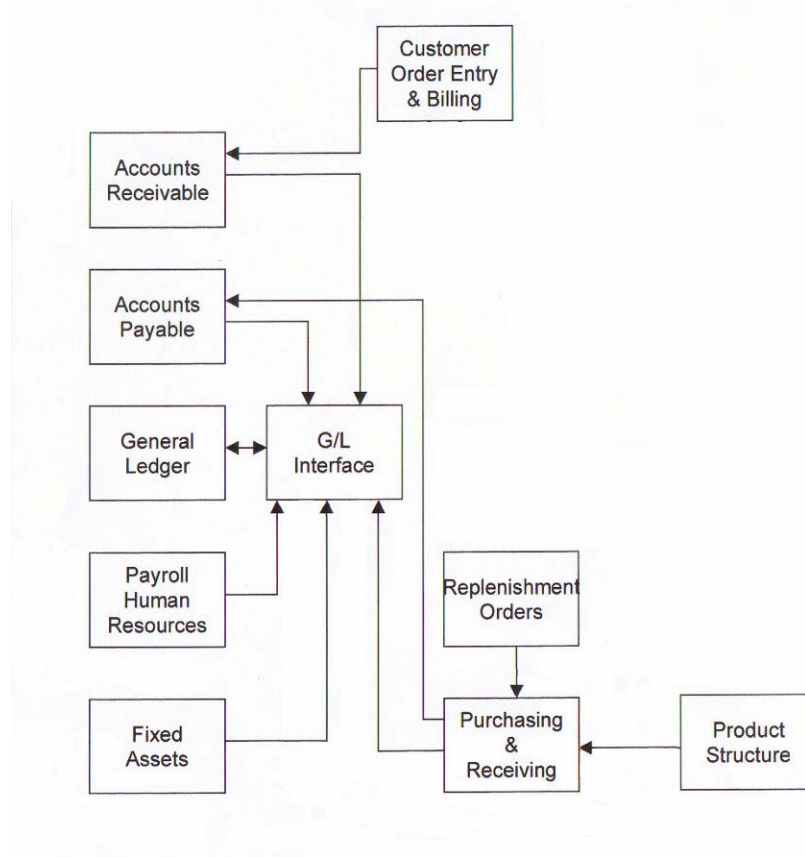


2- Does Lean Planning and Procurement provide an alternative to MRP?

Lean Planning and Procurement (LP&P) is an alternative method to the MRP system. LP&P is focused on eliminating non-value added activities in the manufacturing processes resulting in a more competitive and profitable position. LP&P replaces a computer driven material planning & procurement system with a visually oriented planning and procurement system. The flow chart below illustrates the simplicity of lean flow.

FIGURE 2

TYPICAL LEAN SYSTEM FLOW



3-The Opposition to Change: Get buy in through a well planned Pilot Program

MRP knowledge, training and expertise is a core competency many have based their careers on. How will these people react to a system where the expertise they nurtured throughout their careers is no longer critical, useful or pertinent? How will they feel assessing their historical activities largely as non-value added? This is why the lean movement must be driven from the top down and training and re-training are critical elements for success. It is recommended that an introductory “Town Hall Meeting” is held for all employees explaining the reason for the Lean Journey and the direct benefits to the company and the employees. People must realize this change is essential for the business to grow and is in the long-term interest of a majority of the employees. It should be made clear the goal of the Lean Journey is **not** designed for staff reduction but to apply existing personnel and resources directly to improving throughput. There should be a clear message in the organization that the Lean Journey will be successful, that those of you who join the effort will enjoy a career path with the organization, those of you who elect to impede progress won't.

The LP&P concept is easy to understand but difficult to get people to adopt because it is considered so radical to established beliefs. Once it is properly demonstrated, it is so simple that the change can be implemented quickly. The most difficult concept to adopt

is giving up computer-assisted controls for visual controls. The best way to sell the Lean Concept is to demonstrate the effectiveness to the organization.

4-What is the Lean Implementation Sequence that works?

Companies that have embarked on the Lean Journey typically commence with a pilot product cell to demonstrate the effectiveness of Lean Manufacturing to the organization. This cell should be trained on Lean Concepts and the Operational Focus of 6S to organize the cell and see that everything has a place and everything is in its place. They concurrently drive cycle time reduction through cellular re-layout, standardized work, and process value stream mapping. There is also an effort to move to point of use storage and implement kanban controls. These are the Phase I Lean Activities or the Bronze Category as classified by many companies i.e. United Technologies, Pratt & Whitney, etc.

5- Create an effective Lean Cell within an MRP Environment-The Transition State

The commencement of phase 2 lean activities typically is initiated with a Kanban controlled inventory approach with a detachment from the existing MRP system. A Lean Cell does not require an MRP System to manage Kanban inventory and procurement but the Lean Cell can reside in an MRP driven organization. In regards to material procurement and replenishment within an MRP Environment, it is best to allow the Lean cell to directly procure Kanban materials unique to that cell and for those products that are shared with the rest of the organization, replenish the Kanbans from inventory. To protect the MRP System from “unexpected demands” (non-MRP driven requirements) those items that are shared with the rest of the organization should have the Safety Stock adjusted to compensate for the off-the-system demand to supply the Lean Cell. Of course once the Lean Cell demonstrates to the organization it’s effectiveness, the MRP system can be confidently disabled in lieu of the visual Kanban Inventory management.

6-The Lean Planning and Purchasing Approach

The progressive approach would encompass the following criteria:
No inventory balances, no forecasting, no traditional blanket orders, no cycle counts, no issuing inventory, no pick list, no traditional segregated stock room. In LP&P, the material is moved to where it is needed (Point-Of-Use), there are automated purchase orders and bar coded order placement and receiving. LP&P also encompasses Kanban quantities derived from actual usage and replenishment lead-times, spike order risks identified driving incremental replenishment orders to the Kanban to insure Customer on Time Deliveries (OTD) are met. A system focused on customer demand-pull driving the highest OTD metrics and inventory turns for a maximized cash flow that frees up working capital.

7-Lean Purchasing And Supplier Consolidation:

Lean Purchasing and Supplier Consolidation principals work together. Remember the charter of Lean is to remove waste. In the typical purchasing procedure, the buyer sends out three Request For Quotes (RFQ). After all three quotes are received detailing the pricing, delivery and price breaks; the buyer reviews the information and awards the procurement to the appropriate supplier. Each time the same product is purchased, this process is repeated. Consider all the work and time required to execute a single Purchase Order. What is the cost of that Purchase Order (PO) itself? Some companies use \$50 as a fixed cost per a PO generation.

Now, consider all the activities required to execute a PO at your current purchasing frequency and then imagine your boss telling you that we are not issuing blanket orders anymore or having any scheduled deliveries, you have to buy only what is needed and only when it is needed. You are then directed to get quantity discount prices no matter how little you buy. Can you anticipate the response from your buyer when these constraints are imposed? This is an impossible scenario unless certain tools are in place, Supplier Consolidation and automated Kanban replenishment orders.

Now take the same scenario executing a PO except that you know the exact price and quantity for every order you place. RFQs are no longer needed, no evaluation is required and your supplier is giving you their best price regardless of quantity. The buyer can easily execute POs without hesitation or delay as a result of Supplier Consolidation. Supplier Consolidation is a movement to reduce your supplier base and at the same time present your companies total purchasing power and negotiate better pricing and delivery. Instead of focusing on PO line item details, approach your suppliers with your total companies annual purchasing power. Simply put, explain to your suppliers that the company's annual purchase dollar amount is open for bid and they being one of your premier suppliers have an opportunity to get a larger piece. The increased sales dollars are dependant on their ability to reduce lead time, reduce replenishment quantity and reduce price. Your goal is to give them 100% of your business if they meet your criteria. You make a commitment to develop a win-win relationship and partnership to improve the profitability of both companies.

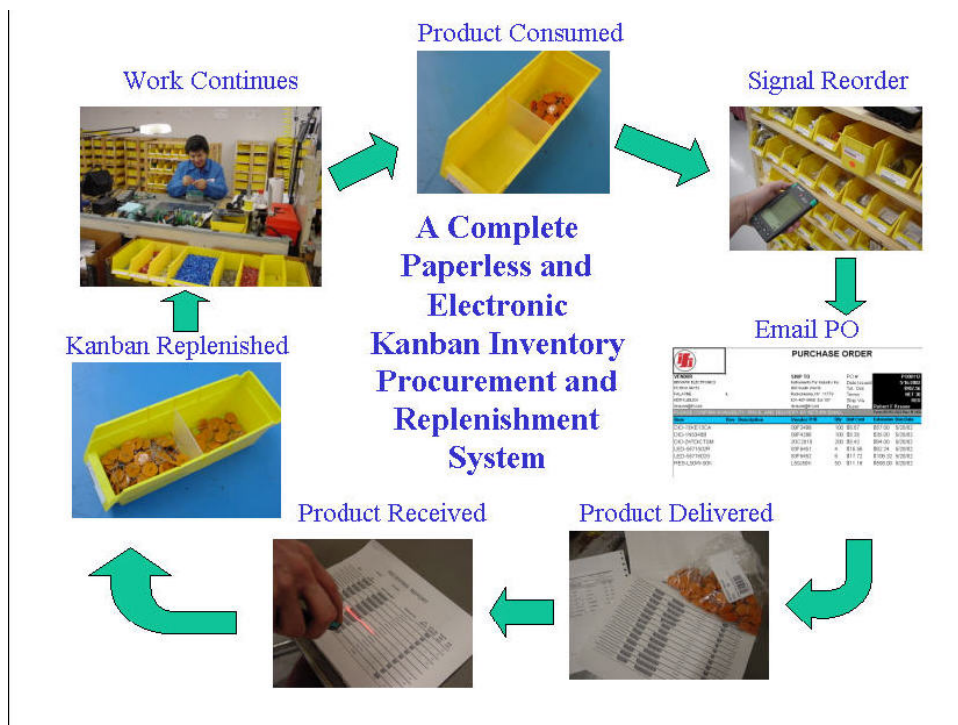
Suppliers are aware of this new business trend and will compete to capture your **total** business; after all, supplier consolidation also leans out the suppliers. Their sales force is no longer required to answer routine repetitive RFQ's. They can now focus on helping their existing customers with designs, quality, cost reduction and cycle time to help their existing customers grow their businesses.

8- Automated Visual Procurement Signals

The next tool that the buyer will need is to automate the visual procurement signals. A KanBan purchase is equivalent to a Purchase Order Request (POR) because a Kanban purchase is initiated outside of an MRP demand. Normally this is done with Kanban Cards or a hand written request. Using Automated Visual Procurement Signals, all products are Bar coded, the reorder signals are visually triggered and those items which require procurement are captured in a Personal Data Acquisition (PDA) device and scanned. All items that require replenishment are uploaded into the systems purchasing queue. With each scanned item, the system knows how to manage those items to be procured, who to buy them from, at what price and quantity. With Lean Software, a visual reorder signal is captured via a PDA, electronically converted into a purchase order and electronically transmitted to the vendor via email. This process is illustrated in Figure 3.

With this system, where visual reorder signals are converted into instant POs emailed to the supplier, and with Supplier Consolidation agreements, the buyer is capable of handling many more transactions as they are now automated, totally transparent, timely and value-added demand driven . POs can be generated with virtually no cost impact to the organization.

FIGURE 3 Automated Visual Procurement Signal



9 -Company Implementations

Lean Journey at NAI

North Atlantic Industries (NAI), Inc. located on Long Island, NY

North Atlantic Industries designs and manufactures I/O Cards, Power Supplies and Instrumentation for the Defense and Aerospace industries.

NAI has built its reputation over 50 years as a provider of high quality COTS and Custom Products in either Commercial, Extended Temp or Full-Mil versions.

NAI is committed to the Lean Journey and has been focused on the continuous improvement of Key Metrics including: Cycle time, Value Added Index, Quality and On Time Delivery and the reduction of feet traveled. It is now moving into Phase 2 of the journey focusing on LP&P to drive improvements in Inventory Turns and Material Overhead.

NAI's Lean Journey took the traditional path using a pilot Lean cell within the organization to demonstrate the effectiveness of the Lean Manufacturing method. NAI has now moved from a process oriented operation to a product focused cellular team based environment. All products have been assigned to 1 of 3 major product families/cells. NAI has been implementing lean principles focused on cellular manufacturing, 6S, Value Stream Mapping and Cellular Team Focus. The results have been dramatic: 75% cycle time reductions, Improvements in value added index from 25% to 50%, Millions of feet of travel eliminated on an annual basis, Improvement in OTD from 82% to 92%, continued quality improvements and a more motivated, empowered workforce. Focused training on team dynamics and skills is a key going forward.

Although NAI is succeeding on the Lean Journey, the next challenge pertinent to this article is to see the benefits of inventory reduction without increasing the cost of material transactions. As an immediate goal, NAI is focusing on automated Kanban replenishment and Supplier Consolidation and anticipates demonstrating significant progress within 6 months. This goal includes increasing inventory turns, reduction of on-hand inventory and significant reduction in the cost of executing transactions. NAI will share in a future articles the many insightful experiences as a result of their Lean Journey focused on their implementation of a LP&P plan to automate Kanban replenishment and execute supplier Consolidation.

Lean Journey at IFI:

Instruments For Industry, Inc (IFI) located on Long Island, NY

IFI was founded in 1955 and is a manufacturer of Wideband RF Amplifiers. They have three product lines, Tetrode Tube Amplifiers, Solid State Amplifiers and Traveling Wave Tube (TWT) Amplifiers which deliver up to 2500 watts of power. These amplifiers require up to a thousand components to construct a single amplifier. IFI is a typical model for a MRP based company benefiting from a Lean Manufacturing process.

IFI has enjoyed an established Lean System for several years now and their achievement pertinent to this article was their focus on inventory reduction through high inventory turns and the automation of their Kanban procurement.

IFI has obtained the efficiencies detailed below through Lean Software providing efficient Kanban material management. Compare these statistics to your organization. Review your current on hand inventory, purchasing volume and staffing to IFI's.

Actual Statistics

Annual Sales: **8.5 Million**

Dollar Value Of On Hand Kanban Inventory: **\$78,292**

No. Of Kanban BINs: **1,856**

No. Of Purchase Orders: **3808/Yr**

No. Of Purchase Order Line Items: **10,452/Yr**

No. Of Invoices: **4,250/Yr**

No Of Inventory turns: **20**

Supporting Personnel:

Purchasing and Material Control: **One**

Receiving and Shipping: **One**

Accounting Department: **One**

10 Summary & Conclusions

Lean Purchasing and Planning is a viable and superior alternative to an MRP based system. As demonstrated in this article, the bottom line cost savings in abandoning a MRP based system is staggering. The savings from shedding the entire MRP administrative overhead goes right to your companies bottom line profit. Abandoning Production Scheduling for one-piece flow and abandoning a conventional stockroom configuration for Kanban point-of-use inventory provides your company with decreased cycle time, increased inventory turns, significant net profit and working capital.

There is a mind-set that a company needs an MRP system and these companies are reluctant to abandon it once they have it. The general feeling is that they incurred the initial expense in purchasing it plus the supporting staff made a career out of using it. A cultural and psychological commitment was established to keep an MRP system active despite the availability of a profitable alternative. In actuality, a company only needs an accounting system to manage Sales, Accounts Receivables and Payables. Manufacturing is managed "off-line" by a Lean Visual Manufacturing System.

In conclusion, making the psychological divorce from an MRP System will increase your company's profitability, expand future business opportunities and for those companies who are financially struggling.....it can make the difference whether a company lives or dies.