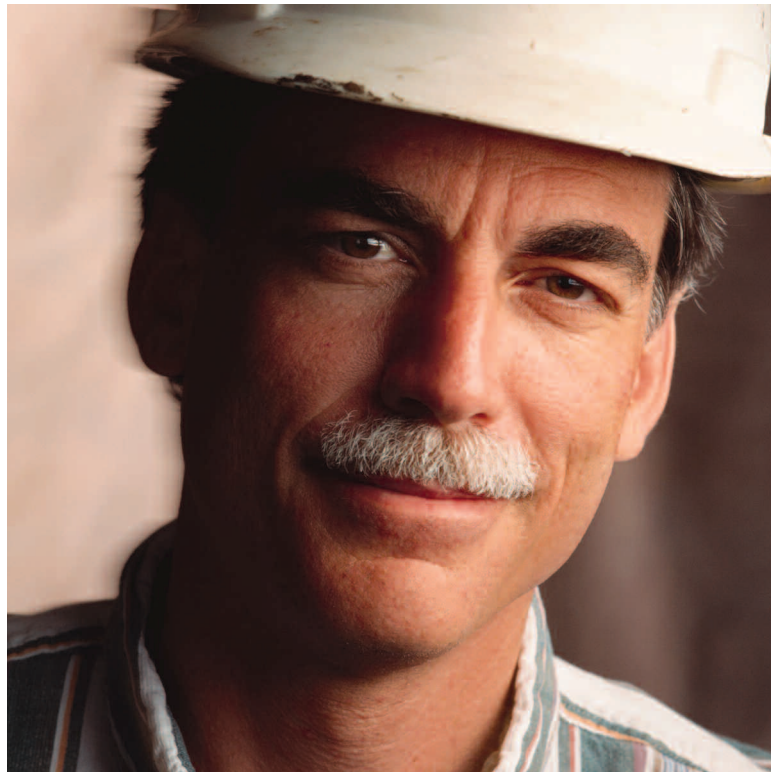


Achieving lean objectives in a project manufacturing environment

The power of soft allocation

WHITE PAPER

Cincom in-depth analysis and review



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Executive summary

If your manufacturing organization operates in a project-controlled environment, you may think that you will be forever relegated to constraining concepts like hard pegging by project, physical segregation of inventory and work-in-process, manual inventory transfers, and the inefficiencies that project segregation often entails. But, if you make or buy common parts across projects, a powerful alternate approach exists that allows you to manufacture like a lean, repetitive, commercial enterprise yet report project performance like a typical project manufacturer. In other words, you can have your cake and eat it too.

The technique is called "soft allocation." Simply put, soft allocation is the temporary assignment of commingled, non-project supplies to project demands. The enabling concept at the heart of this approach is the pooling of inventory and work-in-process, and it requires the use of manufacturing systems that provide for: 1) pooled tracking of commingled common parts and 2) allocation algorithms that distribute pooled common parts back to the originating customer demands. The primary competitive benefit that results is the greatly enhanced ability to adapt lean, commercial processes to what were previously project-siloed operations.

Shifting organizational focus

This new operating model will naturally shift organizational focus from managing projects to managing departments, processes, and pooled parts. Instead of program managers managing functional performance on a project-by-project basis, functional managers will gain more managerial responsibility and accountability and will be increasingly seen as internal suppliers to their internal customers, the program managers. To realize the full benefits of this approach though, the entire organization should be synchronized with the new, leaner manufacturing structure. Ultimately, sweeping opportunities arising out of this approach should even drive the rethinking of a company's entire business model.

But this operational transformation is not a journey for the faint of heart. Its broad scope and impact will require the enterprise-wide envisioning and embracing of bold new ideas and possibilities as well as resolute leadership to deploy and integrate this new infrastructure and culture. For some project-oriented companies, their very survival will hinge on the extent to which they can transform their organizations to be competitively lean using these kinds of bold approaches. So let us see, from soup to nuts, what is involved in such a transformation.

This transformation can be thought of as a full-blown business realignment effort consisting of three phases:

1. pooling of common parts,
2. re-engineering processes throughout the enterprise to take advantage of the new, leaner environment, and
3. reshaping organizational accountabilities, metrics, and culture to create enterprise-wide synchronization with the new operational model.



Pooling of common parts

Project-centric manufacturers often plan, order, and stock parts on a project-by-project basis to ensure they have adequate visibility and control of manufacturing demands and supplies (inventory and supply orders) by project. This process is typically referred to as “hard pegging” or “project pegging.” Many companies in the aerospace/defense industry supplying the United States Department of Defense (DoD) routinely segregate inventory and supply orders by project or contract. Non-DoD commercial manufacturers sometimes do this as well. These companies often use material requirements planning (MRP) and related business system modules to accomplish this segregation. In these sorts of systems, each inventory record and supply order is exclusively “owned” by (pegged to) a single project or work breakdown structure (WBS) task.

But buried in these project-controlled manufacturing processes there frequently lies a significant yet often overlooked trade-off between: 1) the segregation of inventories and work-in-process by project and 2) the achievement of economies of scale associated with the commingling of inventory and supply orders across projects. Unnecessarily constructing project boundaries within manufacturing, procurement, inventory, quality assurance, and cost accounting processes can artificially segment the enterprise into project silos that inherently conflict with the operational need to operate as a fluid, integrated whole. The resulting overemphasis on managing projects as opposed to producing parts efficiently can, in turn, create a major obstacle to the envisioning, developing, and implementing of lean practices throughout an enterprise. So how can we solve this?

To unify and synergize these project silos, soft allocation can be employed. Soft allocation simultaneously manages the physical commingling and logical segregation of manufacturing demands and supplies. More specifically, all MRP-generated dependent demands and supplies are combined within a single non-project-specific pool. This allows supply orders to be aggregated across all contracts at all bill of material levels and, thereby, enables economies of scale and lean practices to be focused on this single non-project-specific pool. Then, at month-end, the pool is recast financially by project by allocating the pooled demands and supplies through all bill levels (and associated part and work-in-process (WIP) order costs) back to their originating independent demands, e.g., contract lines and/or WBS tasks, on an “earliest due date first” basis. In this way, pooled costs become equitably allocated or “attached” to contracts. (See Figure 1.)

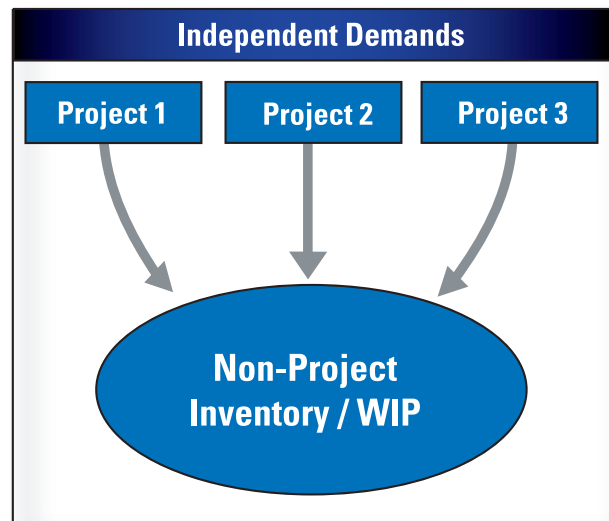


Figure 1

In each successive month, soft allocated costs are reversed and placed back into the pool making them available for the following month's allocation (in essence, placing them into “beginning inventory” of the subsequent month). This process is followed monthly. End items shipped to the customer are hard allocated to projects and are not reversed back into the pool since the ultimate contract ownership of these items (and their cost) is known. See Figure 2 for an example of soft allocation accounting journal entries. At year-end, there are no special procedures required, although the impact of prior year burden transfers (into beginning inventory) should be considered.

This allocation has no effect on the MRP plan itself, since a “snapshot” of the month-end MRP plan is used to allocate items and their associated costs. Manufacturing operations can therefore work with commingled demands and supplies uninterrupted. So you have the best of both worlds: a pooled environment conducive to the application of lean principles along with project visibility of inventory, costs, and audit trails.

Accounting for Soft Allocation (dollars)				
	Common Inventory		Project WIP	Accounts Payable
Month 1	(1) 700	700 (2)	(2) 700	700 (1)
Month 2	(3) 500		500 (3)	

Key:

(1) Purchase material (and labor/overhead costs) - \$700

(2) Record soft allocation entries at month-end - \$700

(3) Reverse prior month soft allocation entries (assumes \$500 soft allocated/\$200 hard allocated)

Figure 2

Impact on revenue recognition, billing, and project statusing

Many companies have pooled inventory for years, calling it “company-owned” or “non-project-owned” inventory. But without the ability to formally manage the allocation of these pooled costs to contract demands, these costs are not available for project level progress billing, revenue recognition, or performance statusing (estimates-to-complete and earned value). This, of course, negatively impacts cash flow, profit reporting, and project cost control. Soft allocation solves this problem since it fully allocates pooled costs back to projects/contracts.

Sometimes there is a concern that allocated costs could swing wildly across projects as a result of changing contract promised ship dates. However, identical swings would occur with hard pegging since inventory would still be transferred (albeit manually) to higher priority projects. Soft allocation simply automates that transfer process.

Other benefits

Another chief benefit of soft allocation is that, since soft allocated costs (and therefore financial forecasts and project estimates to complete) and manufacturing schedules are driven off of the same MRP plan, project managers, project cost analysts, financial accountants, and material planners work off of the same detailed operational plans. The resultant business value is self-evident. In contrast, many companies unwittingly employ multiple, disparate systems across these various manufacturing and finance areas that present different data views of the same underlying business activity. This can cause significant confusion and wasted time in explaining, debating, and reconciling differences between different sets of information.

Other key benefits of the approach include:

- Any supplies that have no MRP demand (inventory, WIP, purchase requisitions, purchase orders, and planned manufacturing orders) are reported as excess and stored in an excess project, so visibility of excess inventory is excellent.
- Soft allocation of purchase requisitions, purchase orders, and planned manufacturing orders provides an excellent basis for automating and explaining estimates to complete/estimates at completion. This can be a major benefit to organizations that struggle each month or quarter manually preparing and analyzing estimates to complete.
- The soft allocated MRP snapshot provides a project-flavored, multi-level pegged view of all MRP demands and supplies traced back to the originating customer demands. As a result, customer promise-date changes can be easily traced to downstream supply orders through all bill of material levels.
- Since allocations are based on the detailed MRP plan, simulated “snapshots” can be generated as frequently as desired, such as weekly or daily. (The month-end snapshot would still be the formal one that drives costs to projects.)
- Companies sometimes prefer to pool some parts and project control others. Some prefer that higher bill of material levels be project controlled while lower level common components be pooled. Soft allocation provides this flexibility, applying soft allocation to only those parts identified to the pool. (This capability can be used to segregate material purchased to cost reimbursable contracts, if necessary.)



Process re-engineering

The resulting consolidation of common parts orders allows production, procurement, and other areas to perform more leanly. For example, production planning will have fewer orders to plan, replan, and expedite; manufacturing will have lower setup costs and, consequently, increased throughput time; quality assurance will be able to inspect in larger batches where sampling sizes can result in fewer items inspected. A more complete list of benefits by functional area is presented in Figure 3.

Improvement opportunities by functional area	
Production planning and control	Fewer planning nodes and events and therefore fewer exception messages and potential scheduling failure points.
Manufacturing	Reduced manual inventory/WIP inter-project transfers, reduced run times per unit (learning curve-oriented), reduced total set-up time.
Procurement	Reduced ordering/expediting costs due to fewer orders.
Receiving/inspection	Lower receiving/handling costs due to fewer orders.
Inventory management/warehousing	Reduced material handling costs (less moving from project to project), reduced square footage utilization.
Quality assurance	Reduced defect rates as a result of fewer setups.
Program management	Less variability of unit costs and easier root cause analysis at the part and process levels.
Cost accounting/cost control	Easier analysis and control of unified pool costs as opposed to analyzing the same costs disbursed over many projects.
Strategic	Enables an integrated enterprise, allows for more effective management control since there are fewer "control/analysis" points, and the points that remain are more similar. This makes analysis, corrective action, and continuous improvement more straightforward.
All areas	Reduced headcount or reassignment of personnel to value-added tasks related to new/additional business.

Figure 3

The operational agility and leanness that results can drive direct product cost reduction, overhead cost reduction, floor space reduction, improved customer delivery performance, and consequently, increased net income and return on investment. Furthermore, because this operational model can so significantly impact these key strategic metrics, it can even become the strategic foundation for creating sustainable competitive advantage. This can easily be seen when comparing a company that adopts this innovative approach to a competitor which fails to do so.

Reshaping the organization

This transformation should not be limited to establishing lean systems and processes. To achieve the full benefits of this approach, all relevant aspects of the business should be assessed and aligned with the new model. The resulting comprehensive organizational realignment will, in its own right, contribute significantly to leanness since it will synchronize company culture and management focus with the more detailed lean process improvements mentioned above. The resulting synergies can be extremely powerful.

Key organizational components of the business that should be reviewed and aligned fall into three broad, interrelated categories: organizational control, performance reporting, and regulatory compliance.

Organizational control

To establish clear managerial control, a program manager should be assigned to the newly created common parts "program" and be commissioned to run this internal "business" like a typical commercial concern. This business (or product line) should be work center/process-centric as opposed to project-centric. As a result, a variety of commercial best practices can be more easily employed such as standard costing, activity-based costing, backflushing, and internal transfer pricing (when parts are "sold" to other internal projects). Also, lean manufacturing concepts can now be more effectively introduced such as plant layout optimization, kanban, waste reduction, parts and process standardization, and just-in-time inventory management. And finally, once the organization is better able to focus on common, combined processes (as opposed to having them chaotically scattered over many projects), a powerful continuous improvement mindset can be cultivated. This last benefit can be the most revolutionary and competitively beneficial as the creativity, teamwork, and speed of the entire organization are unleashed and continuously improved.

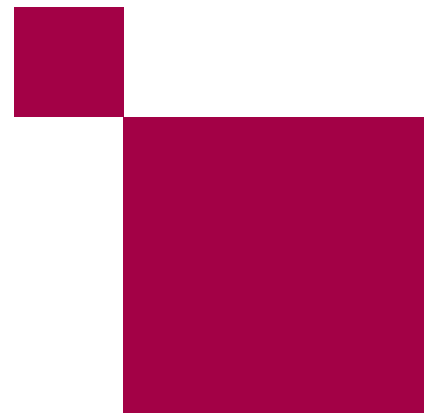
Departmental goals, individual accountabilities, and compensation/incentive plans should also be aligned with the new environment to ensure that the lean objectives and priorities are understood and encouraged.

Performance reporting

Financial and nonfinancial performance reporting should be aligned with this new operational model to ensure that the right metrics are reported – not misleading ones held over from the previous project-centric model. Performance measures that are inconsistent with or irrelevant to the new, leaner processes should be eliminated at the outset since they can create confusion about what management considers truly important. The old adage aptly applies here: what gets measured gets done.

Regulatory compliance

Before adopting a pooling approach, compliance with applicable government regulations should be evaluated such as with FAR1 (governing progress and cost reimbursable billings), MMAS2 (governing commingled inventory tracking), and CAS3 (governing cost accounting practices and disclosure statements). Soft allocation can be shown to be consistent, equitable, and unbiased in its allocation of commingled inventory across projects and therefore compliant with MMAS guidelines. Even so, the opinions of administrative contracting officers and DCAA4 auditors should also be considered. A presentation that explains the approach and significant benefits to the government could be very useful in gaining their concurrence. Another key selling point to government customers is the consistency of the approach with recent US government efforts to drive more cost-effective, commercial practices into its contractor base.



Conclusion

Be prepared for resistance to these ideas from inside and outside the company, including from government auditors. Soft allocation is a relatively new approach to many and flies in the face of standard, hard pegging techniques. But the approach is valid and auditable and once interested parties become aware of the significant benefits to both the company and the government, the methodology can be accepted and embraced by them as well.

About the author

Steve Henderson, CPA (currently non-practicing)/CPIM is principal Aerospace/Defense consultant with Cincom Systems, Inc. He has worked extensively with many prominent A&D companies worldwide designing and instituting ERP-based manufacturing and cost management best practices. Prior to joining Cincom, he was divisional controller for a Fortune 300 manufacturer and a management consultant with Coopers & Lybrand.

References

1. Federal Acquisition Regulations – Govern contracts granted by agencies of the US government.
2. Material Management and Accounting System – Guidelines governing MMAS-covered government contracts (see Defense Federal Acquisition Regulation Supplement Subpart 242).
3. Cost Accounting Standards – Portion of Federal Acquisition Regulations that set forth allowable cost accounting practices used on US government contracts.
4. Defense Contract Audit Agency – US government agency responsible for auditing all US DoD contracts.

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