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Considering supply chain or work management software? Don't consider one without the other... you might just build a monster.

HITACHI
Inspire the Next

The dangers of assembling disparate supply chain and maintenance solutions.

Beware the Frankensystem

Considering supply chain or work management software?

Don't consider one without the other... you might just build a monster.
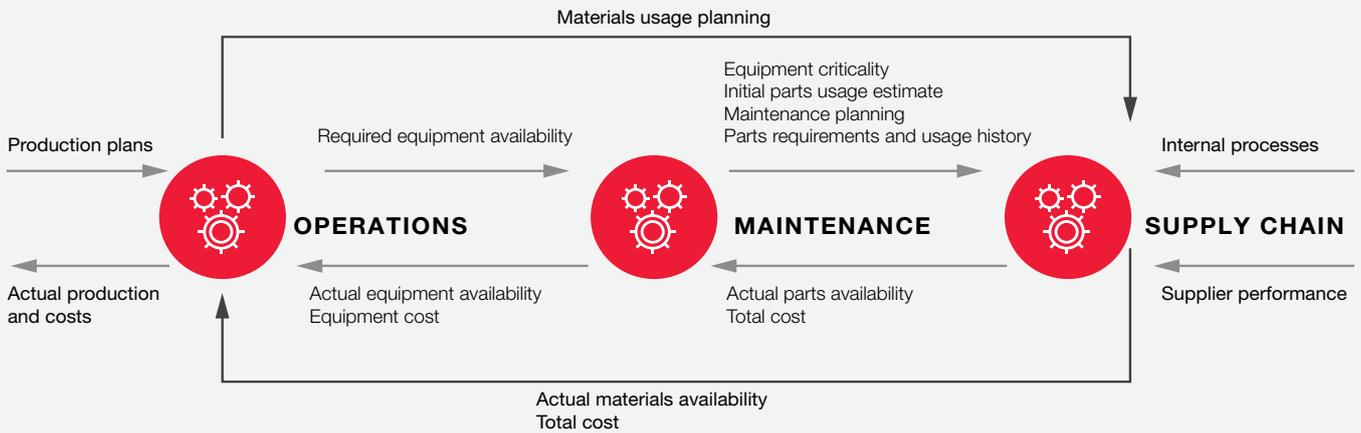
Since the mid-1980s, enterprise software has been developing towards consolidating systems, bringing numerous disparate functions – maintenance, supply chain, finance, etc. – into one system to simplify operations. Around the early 2000s, specialized applications began to appear, filling in perceived gaps in the enterprise systems with highly focused functions. "Best of breed" became the new buzzword, a popular scenario where companies could select these smaller applications for desired functionality in the value chain while still maintaining data integration and consistency across platforms facilitated by the overall EAM[1] system.

Lately though, there's a growing trend for companies to seek out best-of-breed software to replace major portions of enterprise software. Whether replacing existing systems or adding new capabilities missing in older systems, it's important to understand the consequences of installing separate supply chain and asset/work management systems – especially in asset intensive maintenance, repair and operations/overhaul organizations. Yes, it *can* be done, but like with Frankenstein's monster, it is important to ask whether it *should* be. Let's explain why.

Split happens

In asset-intensive organizations, the supply chain function is tightly interwoven with the planning and day-to-day execution of maintenance and operations work, as can be seen in the image below:

Materials usage planning

Production plans

Required equipment availability

Equipment criticality
Initial parts usage estimate
Maintenance planning
Parts requirements and usage history

Internal processes

OPERATIONS

MAINTENANCE

SUPPLY CHAIN

Actual production and costs

Actual equipment availability
Equipment cost

Actual parts availability
Total cost

Supplier performance

Actual materials availability
Total cost

01 EAM: Enterprise asset management system – typically includes both asset and work management functions as well as associated supply chain functions.

Splitting the supply chain from the maintenance/operations side of the business tends to be requested for one of two reasons:

1. The company only wants a work/asset management solution (EAM/CMMS[2]).
2. The company is unwilling to move away from its ERP[3]-based financial/AP/purchasing system (e.g., SAP, Oracle, PeopleSoft).

Here's the problem: Severing the supply chain function from the maintenance/operations side of the business breaks the natural workflow between these highly symbiotic areas. Additionally, integrating systems at the wrong points adds enormous complexity to both systems and processes; it also introduces opportunities for failure as well as data quality issues. As a consequence, important processes become fragmented, less visible and inefficient. Maintenance-driven parts requirements, repairable item management, warranty claims/follow-up; these are all processes that suffer.

The demands of supply

Let's take a look at some common supply chain functions:

Master materials catalog
Contains all catalog items and related information, including item descriptions, part numbers, manufacturers and vendors, etc.

Inventory management
Provides necessary parts and supplies availability to the operation while maintaining stock levels that optimize use of financial resources.

Procurement
Manages the commercial aspects of parts and materials acquisitions to ensure the necessary availability by identifying, evaluating and selecting suppliers and placing and monitoring purchase orders and procurement agreements, including component repairs; monitors warranty claims processing.

Warehouse operations
Used by warehouse and operations personnel to progress inventory through material movement transactions, such as receipts from vendors, transfers between warehouses, r equests and issue of materials for maintenance work, etc.

The functions above are standard, and it's not difficult to find a best-of-breed application to support these functions on their own. Now let's consider all of the ways that these supply chain functions interact with work management needs:

Master materials catalog with work management	Inventory management with work management	Procurement with work management	Warehouse operations with work management
• Use of compatible units for work order design and planning • Use of bills of material for equipment repairs • Item search by stock number, manufacturer, part number, description, equipment • Tracking of specific serialized items • Recording of special handling conditions, safety, hazardous material info, etc. • Calibration support for measuring equipment	• Material reservation and allocation to work orders • Work order cost estimates • Immediate verification of required parts availability • Real-time access to available stock at other locations for emergency needs • Immediate action depending on availability: issue or automatic replenishment • Capture usage to determine appropriate stocking levels; filter atypical and scheduled usage • Vendor lead time data for tracking long-lead items	• Establish procurement agreements conditions that reflect materials' operational impact • Monitor markets to negotiate optimal pricing levels • Optimize procurement process to minimize internal lead times • Ensure timely delivery of purchase orders • Participate in repairable component contract management • Engage suppliers in resolving discrepancy and warranty items issues • Work with vendors to improve lead time for long-lead items	• Pre-staging for upcoming work • Material issues to and returns from work orders • Transfers from other warehouses for immediate needs • Tracking of items that are out for repair • Immediate notification when material is received for planned work • Release of parts holds on work orders • Direct material orders for project work • Work order cost "actuals" • Tool tracking and reservation

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02 CMMS: Computerized maintenance management system – a subset of/precursor to more robust EAM systems; typically focuses just on maintenance management.
03 ERP: Enterprise resource planning system – typically includes financial, HR and supply chain functions.

Specialized software isn't so special

once you recognize all the touchpoints between the supply chain and maintenance.

EXPERT VIEW

IT advisors agree: Supply chain is an essential part of asset management. Gartner® includes inventory and procurement in their definition of enterprise asset management (EAM)[4], while ARC Advisory Group includes MRO materials in their definition[5].

Where best of breed meets actual need

None of this is to say that you don't have options when seeking software systems for your supply chain and/or maintenance department – in fact, there are quite a few, but let's just consider the top three. The first one is obvious: full end-end supply chain financials through to work orders, no integrations required. With everything in the EAM system, your supply chain and maintenance operations enjoy all the benefits of silo-free operations.

The second option is to split functions between finance and account payable. This is an EAM standard, with the fewest touchpoints, making integration simple. Invoice matching and payment are handled in the EAM, with resulting accounting transactions transmitted to the finance system.

The third option is to split accounts payable (AP) functionality, keeping invoice entry/match in the EAM AP system with payment in the ERP AP system; this is also a straightforward interface with no loss of functionality).

Once you move beyond those options[6] – if you try to split the process in other places – you start to introduce extreme complexity into the integration, which is costly to implement and cumbersome to maintain. Invoice matching and error reconciliation, which are easy to do in a fully integrated system, become very difficult. If you make the very unfortunate choice to have your supply chain functionality entirely separate, with materials requirements and purchase requisitions outside of the EAM system, you force users to carry out considerable manual entry and lookup – and doesn't that defeat the entire purpose of a software solution?

A wider range of benefits

With any of the three recommended options for supply chain and work management solutions, you've got systems performing functions they're well-suited to do. Nevertheless, there's no question that the first option – fully integrated work management and inventory – offers huge benefits to your overall operation:

- Compatible units support
- Bills of material support
- Material requesting and allocation
- Work order cost estimates
- Immediate quantity availability status
- Access to stock at ALL locations
- Parts "hold" processing
- Long lead item tracking
- Measuring equipment calibration support
- Automatic purchase requisitioning
- Pre-staging for upcoming work
- Material issuing and returning
- Material transfers for immediate needs
- Repair process tracking
- Immediate receipt notification
- Direct material orders for project work
- Work order cost actuals
- Tool tracking and reservation

04 Gartner. *Gartner IT Glossary.* Retrieved from: http://www.gartner.com/it-glossary/eam-enterprise-asset-management.
05 ARC Advisory Group. (June 8, 2016). *Enterprise Asset Management.* Retrieved from: https://www.arcweb.com/market-studies/enterprise-asset-management.
06 Curious about the "less desirable" integration options for supply chain and work management systems? Contact us for more information!

Consider the business –
the **whole** business

In our app-happy world, where we're accustomed to paying 99¢ (or nothing) for little bits of code that do everything from editing photos to finding a ride to the airport, it's easy to think that satisfying lots of individual requirements is the same as supporting everyone's best interests. It's not.

In asset-intensive companies, the more efficiently and effectively that the supply chain and maintenance operations can work together, the more successful the business will be.

If your organization is considering replacing some or all of your software in either or both of these areas, it's essential that you take into account the synergistic interaction of these business areas. When you talk to potential vendors, don't just ask about individual functional software capabilities; ask them to discuss the real end-to-end processes you rely on every day to maintain your critical assets. And if anyone tells you that you can split processes wherever you want with no loss of functionality, you might want to walk away.

Leave the cautionary horror stories to fiction; understanding the supply chain and maintenance integration touchpoints – from both a systems and a process perspective – should be a first thought, not an afterthought. Making the right decisions now will ensure that the system you bring to life is one that will benefit everyone.

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