



White Paper 2017-18

How to Adapt Supply Chain IT Systems to the Specifics of Project Execution

Standard ERP systems and procurement systems are not well adapted to the specifics of project execution in particular for Large, Complex Projects. Substantial changes and improvements are required. Based on our experience and observations, this White Paper explains the reasons for this issue and what can be done to overcome it in an effective and timely manner.

Supply-Chain processes that are not adequately covered by standard ERP implementations

The following supply-chain processes are often not sufficiently covered by standard ERP or Supply Chain IT systems features and implementations:

- Proper coding for activities, material and equipment, to allow end-to-end traceability from design to construction and analytical accounting
- Post Award process including Expediting process and Logistic tracking
- Schedule-related features for the inclusion of the procurement plan, including plan, forecast and actual delivery dates
- Management of contract including contract administration, variation order, budget control and payment against progress for Subcontract works
- Control of payment process for payments on progress milestones or for partial payment of subcontracts

Standard ERP solutions are not catering for project specific requirements

Why ERP systems are not developed to be fit for projects

Project execution only represents a small percentage of the market for ERP editors, this would explain, according to them, why ERP editors do not invest the effort to develop suitable project-oriented features. Of course, most ERP propose a project module (often mainly including some coding capability and multi-year accounting), and some even advertise that they are specifically fit for project-driven companies. At Project Value Delivery we have observed that these claims do not stand up to the actual requirements in terms of coding, cost control and supply chain management.

We have observed other reasons to explain why the software market have some difficulties or are even sometime reluctant to adapt to projects specifics:

- It should be understood that most of the well-known ERP solutions have been developed to satisfy primarily corporate Finance objectives in manufacturing business and the common usage of ERP in all major organization nowadays demonstrate that ERP solutions meet Finance expectations sometime to the cost of other disciplines.

- Many other disciplines other than Finance are involved at different extent with an ERP framework with the solutions implemented requesting generally some significant changes to the existing processes. In project environment Supply Chain, Assets and Project Control are the most affected.
- One of the main difference between project and other industries involving manufacturing or retail, which is the biggest share of the ERP solutions market, is the key role of project planning through cost control and schedule variance. This complexity requires to have systems to manage Project analytical accounting which is difficult to manage for ERP solutions built more for Finance accounting
- The interface with the full cycle of Engineering (design, detailed engineering, fabrication, construction) is totally absent in all existing ERP solutions compelling companies to develop their own interface.

The issue of material receipt

In addition, a particular issue relates to the receipt of material delivered. Best practice requires that it be done as soon as possible after delivery, opening the crates to check the condition of the material or equipment. It is not always easy to record the result of the receipt in the system itself due to the remoteness and poor connectivity of construction sites. The need to have a good connectivity is enhanced if the ERP system is not easily replicated locally. At the same time, adequate receipt in the system is mandatory for proper 3-way matching processes. This may lead to organize logistics receipt points provided with suitable bandwidth prior to forwarding to the construction site itself. This parameter needs to be considered when designing the logistics plan.

Supply Chain system improvements that are required for being successful in implementing Large Complex Projects

PVD's general philosophy to IT systems implementation

As in any system implementation there is a definite line to be chosen between incorporating features and functionality in the system and compensating for the absence of such in the system by using separate tools and processes. It is not always appropriate to try to include

everything in the IT system, as there is a very observable law of diminishing returns for the inclusion of specific cases. However, there needs to be sufficient functionalities in the system to ensure control and compliance.

In addition, the hard coding of processes in a Supply Chain System is excellent from a compliance and traceability perspective, but can go against the necessary flexibility that is required when executing a project. At Project Value Delivery we are proponents of a pragmatic approach that provides a good balance between control / traceability and the operational needs of a project-driven organization. Thus, our recommendations generally aim at the minimum necessary, leading to simpler and shorter deployments.

Limited and well-chosen developments will provide a powerful support to projects, but do not aim to put everything in your ERP system

Recommendations regarding inclusion in the IT system

In the following recommendation, we assume that the organization is planning to execute a sizeable single project or a portfolio of projects exceeding an order of one billion dollars. We also assume that a standard Supply Chain management IT system or ERP already exists and that the organization does not intend to develop its own bespoke system.

The following table describes our recommendations in such a situation, based on our experience:

Include in ERP customization	Option for ERP system inclusion	Keep outside ERP process
Import of detailed engineering Material Take Off (MTO) and associated coding	On-site delivery dates updates	Procurement Plan (covering all purchase, services and subcontracts packages), including all related strategy, sourcing and scheduling data
Cater for site receipt of material (line by line) and 3-way matching for standard off-the-shelf material	On-site material control	Detailed subcontract control process (ad-hoc follow-up and forecasting files based on the contract details)
Specific purchase-to-pay process for progress-based milestones including invoicing plan (2-way matching)	Expediting log and features (notifications, etc)	
Authority matrix for contract and invoice approvals		

The interfaces with other systems

A system development cannot occur in isolation. When it comes to Supply Chain IT system on a project, the following interfaces must be properly addressed:

- Engineering design tools (e.g. 3D modelling) and, most importantly, their catalogue and coding for a proper input of Material Take Off in the SCM system and the later management of changes due to design development,
- Material control and inventory tools (post-receipt) on the construction site or after the logistics receipt point,
- Accounting tools (if a separate SCM system is being used) to trigger authorization for payment after 3-way or 2-way matching.

Caution note on the time needed to implement ERP or Supply Chain systems changes

The changes mentioned above on the IT systems to cater for project needs are quite significant and require sufficient advance development. Such enhancement projects typically last 6 to 9 months from inception to full delivery, and require contracting external consulting firm experienced in the development of the selected ERP solution after a proper specification has been prepared and agreed. This investment must be part of the preparatory investments to be done prior to the award of a large project. At the same time, the investment will also redeem itself in terms of improvement on smaller projects.

Conclusion

Adaptation of standard Supply Chain Management and ERP IT systems for the specifics of project execution is necessary. At the same time, this adaptation needs to be done with a particular focus on those aspects for which an IT system provides substantial benefits. It is a must to keep control of Large, Complex projects and an investment that cannot be avoided. The investment will provide substantial returns in terms of enhanced control and minimization of procurement costs.

Useful links

- White Paper 2012-07 [‘The Fallacies of All-Encompassing Enterprise Management Systems \(ERPs\) for Project Companies’](#)
- White Paper 2012-08 [‘How To Build Quickly and Cheaply the System Infrastructure You Need to Execute a Large, Complex Project’](#)
- White Paper 2012-19 [‘The Economic Justification of Proper IT tools to Support a Large, Complex Project’](#)



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