

**SELECTING AN ERP PACKAGE FOR YOUR
EPCI CONTRACTING BUSINESS**

**WHITE
PAPER**

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Perhaps the single most important word that can be used to describe the world of the Engineering, Procurement, Construction, and Installation (EPCI) contractor is the word “risk.” With each contract, the EPCI contractor manages numerous variables, confronting a variety of unknowns and is still fiscally responsible for delivering a fixed outcome to the customer, often for a predetermined price. Managing the resulting risk is a top priority as the project is bid, planned, executed and comes to what is hopefully a successful conclusion.

On an EPCI contract, risk is not a static factor that can be determined during the design process. As the project unfolds, the risk profile changes as information on design changes filter through the purchasing and fabrication department and beyond the company’s four walls to subcontractors. To achieve a successful outcome, a project manager must not only ensure successful communication in real time with different internal departments, but with subcontractors and clients as well.

This very demanding business model is one reason that Enterprise Resources Planning (ERP) software should be appealing to EPCI contractors. As project and corporate managers gain visibility in to the supply chain and into the live cost of going projects by bringing the entire project lifecycle into a single computer application, it becomes a lot easier to structure a planned project to limit risk and to manage risk on active projects. Unfortunately, most ERP packages are too limited or segmented in their functionality to allow true project lifecycle management to the EPCI contractor. A truly functional enterprise software tool for this industry must not only provide functionality for engineering, procurement, construction, installation and commissioning, but must allow information to flow easily back and forth between these different disciplines so that risk can be managed dynamically as the project progresses.

Other reasons for a move towards ERP in this industry include trends towards merger and acquisition activity in the industry and increasing globalization. As fabrication and engineering shops merge to form EPCI contracting businesses, and as EPCI contractors purchase other operations around the world, the ability of modern ERP to provide continuity to the merged organizations is attractive. And as the markets served by EPCI contractors becomes less geographically restrictive and companies extend themselves into new countries and continents, an enterprise application that can operate in a number of languages, units of measure and currencies becomes desirable. This globe-spanning capability also comes in handy as engineering and other disciplines are sourced from around the globe, helping to span language and other communication barriers in the supply chain.

In this whitepaper, we'll examine the unique demands that an EPCI contractor places on an enterprise application. We'll also offer a few suggestions for how to evaluate potential vendors and enterprise software products to make sure they completely address the needs of the EPCI contracting discipline.

The need for ERP

EPCI contractors as a general rule run a number of point solutions in different parts of their business, each one dealing with a specific element of the project continuum. This situation has its drawbacks. Consider the process of transferring a bill of materials from the engineering application into a production/procurement application. Essentially, you are exporting the parts list from the CAD tool and start purchasing things on that list. But well after that initial data transfer, engineers often are called on to revise the design. But as these design revisions are made, there is not a corresponding change in the part numbers released to purchasing. From the standpoint of the procurement and fabrication departments, it would appear that the original design is still operative and money and resources are spent in executing it. Only later do they realize the materials they have on hand no longer conform to the project's requirements.

While integrated point solutions are not well equipped to allow visibility between departments, they are even less well-suited to provide visibility beyond the four walls of the company and into the operations of subcontractors retained to execute portions of the project. This presents a problem, for instance, because as changes occur to the design, there are implications for the subcontractors as well. Oftentimes, there are clauses in the subcontract agreement regarding how changes are handled—clauses that can have budgetary implications. If a team of project engineers are working from Excel spreadsheets, they likely do not have immediate

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access to information on how subcontractors are to be paid, and changes made to their documentation often are not communicated effectively into the project or general ledger accounting systems. This means that substantial subcontractor fees can accumulate without showing up in the project accounting system until it is too late to adjust the budget to accommodate the added expense. The ability to ensure that subcontract agreements are followed, the ability to get good information to the subcontractor and re-introduce cost and activity information from the subcontractor back into your project accounting system are vital to maintaining control of the project and capturing live cost.

Unfortunately, most ERP products and other packaged enterprise software are ill-equipped to deal with these complexities of EPCI contracting. Because ERP has its roots in manufacturing, many of these tools are better adapted to environments with a sharper delineation between the design and manufacturing process. That is probably why so many EPCI contractors are still using point solutions for finance, human resources and purchasing, and perhaps using in-house or self-developed solutions for materials management, fabrication, engineering and other core processes. ERP systems developed during the 1980s and 1990s were based on the concepts of Manufacturing Resources Planning (MRP) and similar systems that add capacity planning to deliver MRP2. Both of these methodologies assume certain standard business and manufacturing structures. But what EPCI contractors face is a non-standard, project-driven structure that changes with each project and sometimes during the course of the project. As EPCI contractors move away from materials management now more towards project-focused management, they will have to find an ERP solution that is flexible enough to meet these very unique needs.

ERP for EPCI

An EPCI contractor has very few options in packaged software that truly satisfy all of their requirements from pre-bid to design to project completion. Identifying a standardized IT platform that will meet these needs is a challenge, but can deliver better results and be a lot less expensive in the intermediate term than heavily customizing of a standard manufacturing ERP package or integrating a number of point solutions.

Perhaps the single most difficult requirement for the EPCI Contractor to meet is the need for tight integration between a CAD solution used in the design phase and the rest of the project functionality. Changes made to the design affect the budget, purchasing and fabrication requirements and need to be communicated efficiently to subcontractors.

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Other crucial elements to look for in an EPCI software package include:

- The ability to handle collaboration in engineering and procurement with an external fabrication contractor. The ability to dynamically share design and other project data in real time allows these subcontractors to behave more like an integral part of the project team.
- The ability to see beyond a materials list. ERP systems of old typically dumped a materials list from engineering into a purchasing module. But changes that take place in an EPCI project might not affect the purchase part numbers at all, but are more likely to affect the tags, the objects, the documents and the relationships between part numbers. These changes must be easily visible to other project team members in procurement and construction and to the subcontractors. Tight integration between engineering and procurement is key.
- Visibility of project financials. When it comes to project accounting, the general ledger is kind of like reading the newspaper. You can see what has happened but it is certainly too late to do anything about it. In order to change the outcome that feeds into the general ledger, you need to see where you are going, not where you've been. That's why the visibility of project cost and progress is so important. After all, if your enterprise software allows you to see deviations from the budget as they happen, you can then look forward and make alterations or manage the project in such a way as to remain within budget parameters. More and more EPCI contractors will be making this move from general ledger to project management and control.

Much of the focus of the EPCI contractor is on managing risk and preventing the negative outcomes of cost over-runs or failure to deliver on-time and as specified by the project owner. Managing engineering, construction and subcontracted construction to deliver a project within time and budget parameters requires an ongoing process of managing risk as project variables change. With all this focus on risk, however, it is still important to realize that implementing the right enterprise application can provide an important upside—a competitive advantage—to EPCI contractors who get the technology side of their business in order. After all, much of an EPCI contractor's success depends on submitting the best bid document. A contractor with better cost controls, who can anticipate real costs and prevent hidden cost by correctly allocating expenses to specific contract tasks, can confidently submit a more competitive bid. With the right measures in place to both avoid unbudgeted expenditures and identify cost over-runs early enough to make adjust-

ments, an EPCI contractor can avoid the unpleasant fiscal surprises that can crop up towards the project's conclusion. The ability to tender a more competitive bid and to prevent budgetary overruns translates into a greater number of projects that can be completed profitably.

What to look for

While the number of packaged software options that meet the needs of the EPCI contractor are limited, opportunistic vendors may certainly attempt to sell suboptimal products to the EPCI industry. A certain amount of due diligence is required to ensure that a multi-faceted enterprise software tool will do what a vendor says it will do. There really is no substitute for asking a lot of questions of a vendor, and requiring the vendor to show you how your business processes would be executed in the software itself rather than in general Powerpoint slides.

Do your best to look beyond the outward appearance of the solution to see how the application copes with changes and risks. Make a vendor run the solution with actual project data, ask them to change something in engineering or in the project structure and see how the technology deals with that. In the application and product documentation, watch for verbiage that indicates that this is actually an EPCI solution and not a repackaged manufacturing solution. Terms like project, contract, subcontract, engineering and fabrication should be present in abundance. If those phrases are not there, it might be best to walk away from that vendor.

Another thing to watch for is the flexibility of the solution and how it can be reconfigured as your needs change. This change might take place on an individual project and require on-the-fly changes in the work breakdown structure as represented in the application. It is therefore important to consider how the application adjusts to changes that transpire in the course of a project. Other changes have implications for the way the company does business in general. As regulations and customer requirements change, as you enter new markets, add new disciplines, acquire competitors, how easy is it to configure the application or add functionality to meet your needs? Some applications make change over time a lot easier than others, while others require a complete re-implementation that brings heavy cost both financially and in terms of business disruption.

On a more granular level, here are some specific types of functionality to watch for and consider during the ERP selection process.

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- Functionality to help you manage and control complex contracts. An application should let you record invitations to tender, respond to tenders, monitor negotiation processes, and track the conversion from tender to contract. It should also allow you to record work progression, and allow for revisions of contract baselines at the same time as you manage cash collection activities like application for payment.
- Project-Centric. Make sure that the project plan is the central engine driving progress, procurement, off-site manufacturing, construction and installation. When all business processes are working within the same planning document, team members can easily drill down into details or view information and progress on aggregated levels. The application should also support two-way integration with leading planning tools such as Primavera, Microsoft Project and Safran. This means that information should not only be exportable to these project management tools, but changes made in the third-party program should flow back into the enterprise application,
- Designated risk management functionality. An ERP package for EPCI contractors should not only create a list of potential problems, but also facilitate a process of constant review, evaluation and actions on any incidents that occur during a project. Information should be structured and presented in such a way as to help an EPCI contractor understand risk and then mitigate or avoid any impact.
- Engineering and design support. An ERP package for EPCI contractors ought to include a comprehensive multidisciplinary engineering register for process-, electrical-, instrumentation-, and AEC/piping engineering. It should also include integrated document management, and support design of new projects as well as the modification of projects that involve assets in operation.
- Support for material, inventory and supplier catalogs to secure the material management process. All drawing parts should belong to a project activity and have a scheduled required date. When you calculate the material take-off, the application should generate a complete survey of the total material requirements and work effort for your EPCI project, including the required dates. Planners should be able to monitor the progress of each contracting and fabrication area with warehouse control that tracks details by project for materials issued to different production processes. These progress details should be rolled back to the overall project to ensure total control.

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- Visibility of work done by suppliers. Production operations and the cost of the work that has been outsourced to suppliers should be visible within the ERP application. This means that the project managers can, from within the enterprise application, verify whether suppliers are delivering according to plan and evaluate the consequences of delays or failures from the perspective of the entire project. Ideally, the ERP package should allow for a number of types of arrangements with subcontractors including contracts, which allows the EPCI contractor to control payments by percentage of work completed and purchase orders, which offers greater control over systems and prices.
- Dynamic connection between projects and the general ledger. In the ERP package, financial transactions should be automatically created at the source event within the project and automatically updated to the company's central financial records to ensure that cost and revenue are correctly posted on the work breakdown structure and entered into the general ledger.

About IFS

IFS, the global enterprise applications company, provides solutions that enable organizations to respond quickly to market changes, allowing resources to be used in a more agile way to achieve better business performance and competitive advantage.

IFS was founded in 1983 and now has 2,600 employees worldwide. IFS has pioneered component-based enterprise resources planning (ERP) software with IFS Applications™, now in its seventh generation. IFS' component architecture provides solutions that are easier to implement, run, and upgrade. IFS Applications is available in 54 countries, in more than 20 languages.

IFS Applications provides extended ERP functionality, including supply chain management (SCM); enterprise asset management (EAM); maintenance, repair, and overhaul (MRO); product lifecycle management (PLM); customer relationship management (CRM); and corporate performance management (CPM) capabilities.

IFS has over 500,000 users across seven key vertical sectors: aerospace & defense, automotive, high-tech, industrial manufacturing, process industries, construction & facilities management, and utilities & telecom. IFS also provides a cross-industry solution for Retail & Wholesale Distribution.

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