DIGITAL INDUSTRIES SOFTWARE

Integrated project planning and execution

Executive brief

Maintaining control of your shipbuilding projects in the face of uncertainty

Navigating a sea of uncertainties

As the demand for high value-added vessels increases, so does the complexity of the design and manufacturing process. With increased complexity come increased risks and the need to control and mitigate those risks. In addition, years of low contracting in the shipbuilding market have generated a climate of unpredictability and increased competition. With market uncertainty on the rise, a shipyard's reputation and its ability to secure new business will depend on bid accuracy and completeness. So how can shipyards maintain control of their projects and ensure they deliver on time and on budget?

The importance of accurate planning

Shipbuilders know that accurate planning provides a healthy foundation for any project. Therefore they have invested in a variety of systems to oversee project planning and execution. These systems usually include enterprise planning tools (EPT), enterprise resource planning (ERP) and product lifecycle management (PLM). Also critical is the work breakdown structure (WBS), which describes the project in terms of hierarchically related product-oriented elements. The WBS is usually defined in the EPT before it is uploaded to the ERP and PLM tools.

The decision to implement PLM, ERP and EPT systems usually lies with different functional teams. As a result, the choice for a particular system is often made with the team in mind, based on which specialized tool would best help them manage their part of the overall project, as opposed to the entire organization. Those systems are often partially connected, but not always through an intelligent interface: Changes in one system are not automatically reflected in the others. This disconnect can result in inconsistencies between requirements, logistics and planning, and ultimately cause delays. To avoid this, teams need to manually check that each system is up to date with the correct information as project plans evolve. This is a time-consuming activity that is not scalable as projects grow in complexity.

Information in disjointed systems does not support collaboration between different teams, makes it difficult to get an accurate view of current and past projects and

has a direct impact on both risk management – how can risks be efficiently mitigated when project information must be extracted from multiple sources and pieced together? – and bid management – how can an accurate business case be built without comprehensive access to reliable historical data in one centralized location? As a result, many shipbuilding projects continue to under-perform against their plans and time, cost, quality and performance commitments.

Marine organizations are unable to properly identify potential risks and opportunities when preparing bids

The limitations of the current model

Many organizations do not realize that poor upfront planning is a direct result of not having a good basis of estimates to accurately build a business case and proposal, as well as a poor understanding of the project scope by individual areas. Without a master system serving as the single source of truth for all project data, shipyards are unable to adequately monitor real-time project progress and earned value against vessel performance requirements and project deadlines.

The lack of visibility into the true project status is impeding the project manager's ability to build an accurate plan that includes resource optimization, workload balancing and critical path analysis, or take proactive corrective action when needed. It also makes it difficult to understand the true impact of changes. Change requests, such as requirements or design changes, are common in the marine industry. Without an integrated, common WBS, shipyards cannot see which pieces of equipment are linked to specific requirements and how design changes affect those requirements. As a result, shipbuilders cannot accurately estimate the impact of changes on downstream functions, or ultimately on overall cost and schedule.

Having no integrated project management system also hinders cross-team communication and collaboration, including synchronization with co-makers and subcontractors. Communication silos result in inefficient workflows, for example duplicated tasks, increased rework, ballooning costs and schedule delays. They also make it difficult to maintain an up-to-date record of historical changes to the project and establish accountability for such changes.

Another consequence of this disjointed approach is that marine organizations are unable to properly identify potential risks and opportunities when preparing bids. Inaccuracies in business cases and bids pose a major challenge to winning new projects or delivering vessels on time and budget.

Shipyards attempt to analyze intricate data from past bids to provide accurate estimates for future bids. Such historical data is often kept in a disorganized range of documents that are hard to locate. As a result, teams often inflate their estimates when calculating the costs of future projects, which may make their bids unattractive and hurt their ability to win new business. Inaccuracies also increase the chance of schedule overruns during project execution if a bid is won based on erroneous schedule estimates.

Shipyards must combine cost, schedule and technical requirements in one integrated project planning and execution system to successfully meet ship owners' and operators' demands. The current disconnected approach does not empower them to achieve end-to-end visibility of their projects and puts them at risk of cost overruns or penalties for delays or unmet technical requirements. Eventually, the disconnects will jeopardize their efforts to win new business, develop new products, and satisfy customers, investors and shareholders.

A new way forward

The only way shipbuilders can effectively control project risks is by building a centralized project management system for all project artifacts, including WBS, costs,

The IPPE octopus combines cost, schedule and technical requirements in an integrated project management solution.

schedules, technical requirements and execution status. For enhanced accessibility, scalability and flexibility, shipbuilders may opt for a secure cloud-based solution. A centralized system, whether on-premise or cloud-based, enables robust change management, because any changes made to vessel designs or project plans at any point in the process will be immediately reflected enterprise-wide. This allows shipbuilders to integrate vessel requirements throughout the product lifecycle, enabling them to control concurrent engineering processes across domains and between design and manufacturing operations.

Having a common WBS that is fully integrated with the EPT, ERP and PLM systems also increases traceability, removes workflow inefficiencies and ensures that functional teams across the organization work collaboratively towards delivering the project on time and on schedule. An integrated master schedule (IMS) can be generated, which enables shipbuilders to measure their progress against the project performance goals and execute deliverables efficiently. Furthermore, workflows and processes can be further improved by closing the loop on the WBS by feeding back best practices and lessons learned throughout the project.

Shipbuilders need a fully planned, resourced and budgeted end-to-end project management solution to steer today's increasingly complex projects to successful completion

Shipyards can also use the insight provided by past and present efforts to intelligently inform future proposals. Using historical data to evaluate costs, schedules and risks increases the accuracy of bids and the opportunity to win new business. In addition, by connecting risks and requirements from the very beginning of the project, shipyards will be able to incorporate opportunity assessment and risk mitigation into the project plan – reducing the risk of unexpected delays and setbacks.

Conclusion

By integrating cost, schedule and technical requirements in a fully planned, resourced and budgeted end-to-end on-premise or cloud-based project management solution, shipbuilders can eliminate inefficiencies, unpredictability and disarray that results in failed bids, cost overruns and schedule delays. In today's climate of rising uncertainty and competition, delivering on time and on budget can propel an organization's reputation, and there is no better guarantee of future revenue. For more information, visit siemens.com/ippe

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