



Single Point of Truth for Capacity Planning



Background

Irving Shipbuilding recently completed construction on a world class fabrication facility in Halifax, Nova Scotia. The modernized Halifax Shipyard, one of the largest single undercover shipbuilding facilities in the world, ensures production efforts are no longer affected by the adverse weather Atlantic Canada can experience. As part of its modernization, Halifax Shipyard introduced new policies and planning systems to allow the yard to realize its full potential.

Case Study.



Halifax Shipyard's previous planning system presented several shortcomings that did not allow the facility to reach its full potential.

1. Large amounts of manual effort were needed to maintain plans and conduct analyses
2. A "single source of truth" did not exist for capacity planning and shop floor foot-printing
3. System was "Static" and could not facilitate the desired real-time "Dynamic" capabilities
4. Original floorplan and capacity planning used a combination of several tools with each system acting as an "island of information" with no interconnectivity

The capacity team's plans are critical to the shipyard's success and multiple departments rely on them. Irving Shipbuilding needed access to the plans across the organization. The previous system could not manage workflow, data was not centralized or kept up to date, nor was it available across the organization.

The planning system could not keep up with business demands and hindered the needed growth of the organization.

Project Objectives

Irving Shipbuilding's objective was to develop and deploy an automated enterprise capacity planning tool for the Halifax Shipyard, enabling the capacity team to rapidly plan production, footprint the facility, and test multiple what-if scenarios. The desired result was that critical information was disseminated to both operations and key management stakeholders. The new planning system needed to:

1. Provide direct and up-to-date online access of capacity allocation plans and related data with nightly updates from authoritative data sources
2. Increase the use of the effective laydown space through utilization of automation and machine learning
3. Enable rapid and accurate analysis of multiple possible future states
4. Increase the pace of vessel fabrication through better space utilization and production sequencing

Specific Tool Requirements

Success was defined by the following system requirements:

1. Analyze spatial and personnel resource requirements of multiple possible schedules
2. Propose alternatives to schedules in conflict with constraints (space/time/labor)
3. Identify bottlenecks and problem areas
4. Identify and reduce overall storage of units between stages of construction
5. Simulate long-term strategies
 1. Multiple new hulls/classes within the facility
 2. Determine capacity limits and potential for facility growth (if required)

Challenges

- Manually maintaining plans and conducting analysis
- Static planning system without any interconnectivity or dynamic capabilities
- System could not keep up with critical demands

Results

- Reduced fabrication costs
- De-risked schedule
- Rapid and agile response to re-baselining and “What-If?” scenarios

Solution

Shipyards AI®, a cloud-based application, is used to visualize multiple production scenarios, analyze potential results, and optimize decision-making

The Solution: Shipyard AI[®]

Irving Shipbuilding engaged with BigBear.ai to help visualize and analyze multiple production scenarios and optimize the shipyard footprint, schedules, and throughput to improve its bottom line. Shipyard AI is a multi-user, “web” enabled application that uses an optimization-based automated capacity planner to create and publish laydown maps and a schedule indicating where items are to be located over time.

Shipyard AI enables Irving Shipbuilding to:

1. Analyze spatial and personnel resource requirements rapidly, accurately visualize multiple production scenarios, and propose alternatives to schedules in conflict with constraints
2. Manage multiple hull configurations / multiple vessels under construction simultaneously
3. Utilize and adapt limited space greatly impacted by changes in schedules and fabrication plans
4. Increase the pace of vessel fabrication by identifying bottlenecks and mitigating schedule slip impact
5. Provide direct and up-to-date online access of capacity allocation plans and related data with nightly updates from authoritative data sources

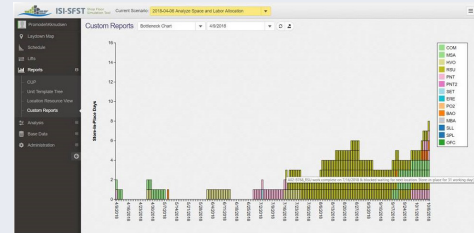
Bottleneck Report

Graphically demonstrating locations of time and space-related bottlenecks

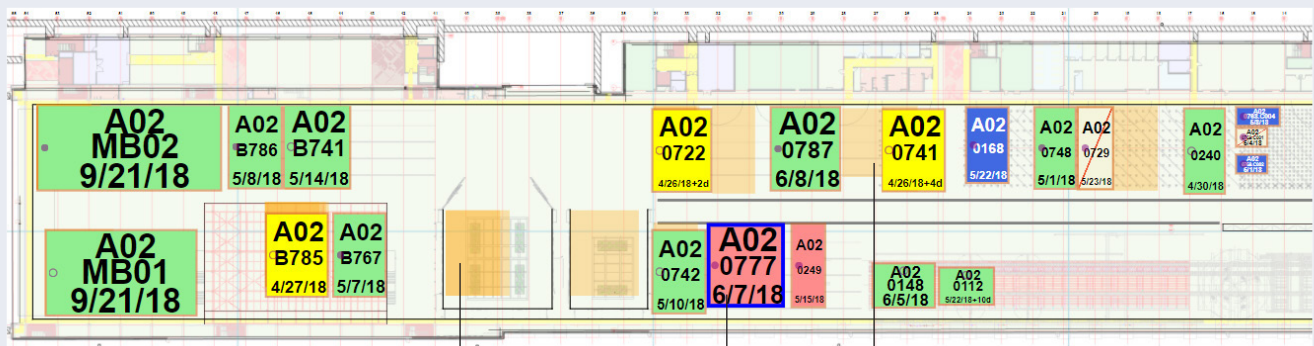


CUP-Footprint

Space utilization of facility locations by hull over time



Dynamic Laydown Forecasts Space Relevant Production Disruptions



Select unit to see impacts of moving it

Highlighted yellow are the “ghost” units; Locations assigned to future construction

Single Point of Truth for Capacity Planning

BigBear.ai delivered and implemented the Shipyard AI planning system in under 5 months while staying on budget and ahead of schedule. Irving Shipbuilding can now rapidly plan production, footprint the facility, and test multiple what-if scenarios. Critical information is now available to both operations and key management stakeholders. Additional results include:

1. Reduction in ship to ship fabrication costs
2. De-risked schedules and speed on operational decisions
3. Shift in focus from firefighting issues to improving situations
4. More stable production plans that provide a more predictable environment
5. Planning for repeatable work stations
6. Rapid and agile response to re-baselining and “What-If?” scenarios
7. Satisfied First Marine International (FMI) regulatory recommendation



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Are you ready to solve the complexity and variability of enterprise planning and logistics with powerful solutions that use data-driven, predictive simulation technology?

BigBear.ai's market-focused solutions illuminate what is happening right now inside your organization, and what could happen—leveraging KPI-based scenario planning to accelerate process improvement. With BigBear.ai, you can:

- Deeply understand your current facility, equipment & personnel systems

- Forecast infrastructure & equipment requirements
- Accurately predict production schedule, even with supply chain & logistics issues
- Manage throughput & cycle time performance on constantly changing systems
- Simulate & prepare for real-world situations with digital twin visualization

Learn more about Shipyard AI and other BigBear.ai Enterprise Planning and Logistics solutions at BigBear.ai.