Capacity Planning and Shop Floor Foot-Printing Application

ISI-SFST Shop Floor Simulation Tool

IRVING

Irving Shipbuilding, Inc.

Success Story

Shipbuilding

Shipyard AI

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 that would allow the yard to realize its full potential.

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

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

Multiple departments depend upon the plans produced by the capacity team and up to date unit flow plans were critical to the Shipyard's success. Operations, Production Planning and Business Development depend upon high quality and up to date information. The existing system could not keep up and would hinder the needed growth of the organization.

PROJECT OBJECTIVES

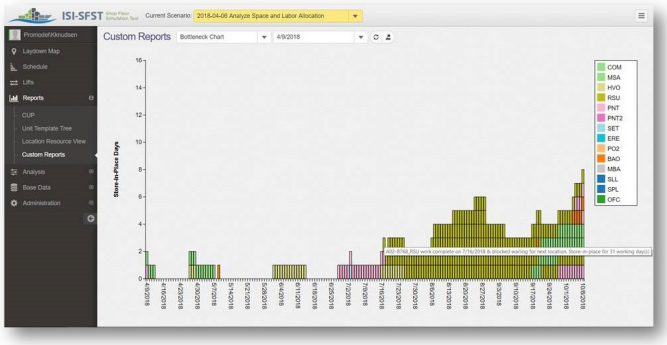
The client's business objectives for the initiative were:

1. Develop and deploy an automated enterprise capacity planning tool for the Halifax Shipyard that would enable the capacity team to rapidly plan production, footprint the facility and test multiple scenarios resulting in critical information to operations and key management stakeholders.
2. Provide direct, up-to-date, online access of capacity allocation plans and related data supported by nightly updating of information from authoritative data sources.
3. Increase the use of the effective laydown space through utilization of automation and machine learning.
4. Enable rapid and accurate analysis of multiple possible future states.
5. Increase the pace of vessel fabrication through better space utilization and production sequencing.

Specific Tool Requirements

- Analyze spatial and personnel resource requirements of multiple possible schedules
- Propose alternatives to schedules in conflict with constraints (space/time/labor)
- Identify bottlenecks and problem areas
- Identify and reduce overall storage of units between stages of construction
- Simulate Long Term Plan Strategies
  - Multiple new hulls/classes within the facility
  - Determine capacity limits and potential for facility growth (if required)

SINGLE POINT OF TRUTH FOR CAPACITY PLANNING



Bottleneck Report:

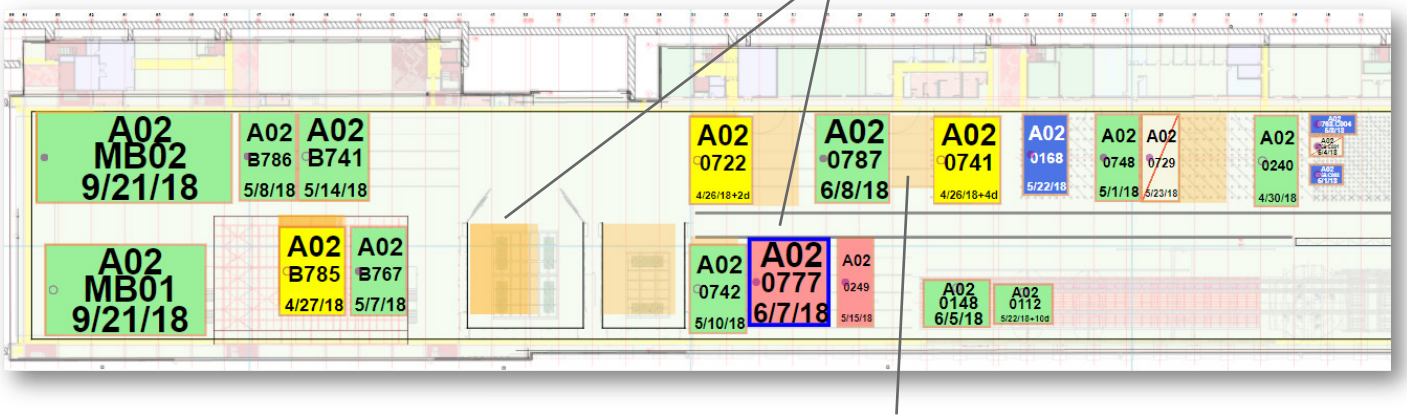
Graphically demonstrating locations of time and space-related bottlenecks

CUP-Footprint:

Space utilization of facility locations by ship 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

KEY BENEFITS

Quantitative:

- System was delivered and implemented in under 5 months; on budget and ahead of schedule
- Ship to Ship fabrication costs were reduced
- Since the software implementation just concluded in the first quarter of the year, ISI has not seen the full benefits on the floor, but it is expected to de-risk schedules in the near future and speed on operational decisions

Qualitative:

- Focus of effort shifted to improving situations not just firefighting issues
- Production plans are more stable providing a more predictable environment
- Satisfied First Marine International (FMI) regulatory recommendation
- Enabled planning for repeatable work stations
- More rapid and agile response to re-baseline requests and "What-If?" scenarios

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