Determining the Days of Supply for Class 1 Inventory Aboard U.S. Navy Ships

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Abstract

Inaccurate Days of Supply (DoS) reporting for Class I subsistence continues to complicate U.S. Navy logistics planning, especially in contested environments requiring reliable push resupply. Existing methods including dollar-value calculations directed by OPNAV Instruction 2000/201 and the uniform case-based estimates of the Class I Operating Picture often produce conflicting results that do not reflect actual at-sea consumption.

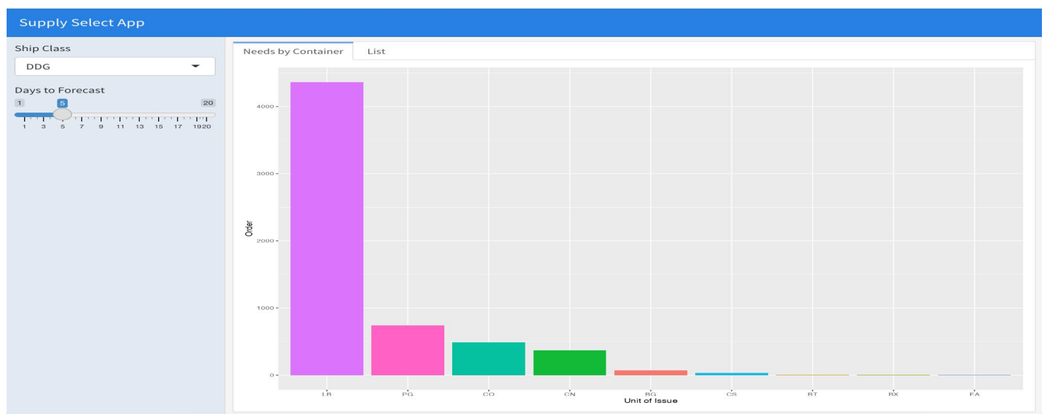
This thesis introduces the Supply Select App, an interactive R Studio tool built from nine months of real Food Service Management System transaction data. The application allows users to select a ship class and forecast horizon, then returns precise, platform-specific Food Item Code level quantities consumed during the longest comparable historical underway period. The resulting exportable resupply lists and visualizations enable fleet commanders and shore planners to determine accurate DoS and generate tailored push-logistics orders without real-time shipboard reporting. By grounding subsistence planning in empirical consumption data, the Supply Select App significantly enhances forecasting accuracy, storage efficiency, and operational readiness across the fleet.

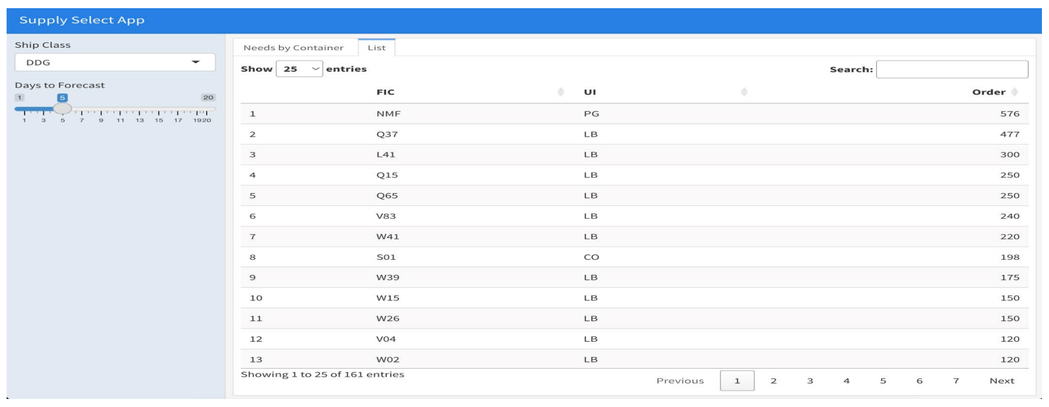
Methods

- Analysis was conducted using R (version 4.3.1) with data, visualization, and dashboard packages.
- Descriptive statistics were computed for each ship class and FIC category to identify consumption patterns.
- A custom “GetList” function modeled consumption using filtered FSM3 data and a 1-20 day forecast horizon.
- The model uses linear extrapolation from historical averages for simplicity and deployability.

Results & Impact

- User friendly application built to generate accurate FIC usage and real time consumption outputs.
- Identified highest-demand products, with top ten items comprising most at-sea consumption.
- Ship class specific consumption profiles produced more precise forecasts across 14 platforms.
- Accurate daily consumption, Projected DoS, and Projected Order Quantity metrics enable improved inventory planning.
- Offline capable tool enhances resilience and supports logistics in degraded information environments.
- Improved accuracy of FIC usage data directly supports determining true Days of Supply on board.





Future Research

- Track longitudinal shifts in consumption across regions, operational tempos, and evolving menu standards.
- Explore machine learning and advanced analytics to enhance Class I forecasting while maintaining deployability.

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