Empty Repositioning Optimization

utilization
Effective Optimization
Reduce Cost
Increasing Operating Rates
Freight Monitoring
Equipment Maximum
1. Introduction

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The global container trade has rapidly increased over the last 2 decades, migrating from a break bulk dominated industry to predominately containerization.

Today approximately 90% of non-bulk commodities are transported by containers. Containers has successfully standardized the transport industry creating massive efficiency’s such as reducing shipping times by approx. 84% and improving costs by 35%, but with new direction comes new challenges. The first real challenge is finding the balance between container utilization and turn times. When looking at the challenge at hand, the ultimate goal is to achieve maximum utilization combined with the shortest possible turn times.

Effective monitoring of your container utilization and turn times enables lines to inject or reduce the container fleet size. Poor decision making in this regard increases turn times and decreases utilization, which has a massive impact on a shipping lines bottom line.

*Good fleet manage can be illustrated in the graph by the lines moving closer to each other as utilization is improved and turn times are decreased.*

2. Why get concerned about the equipment?

As Liner companies buckle down to compete, they need to either maximise their revenue through increasing freight rates OR reduce operating costs. Both these options hold there own challenges in the current economy state.

Based on reports published in 2003, the cost of empty container transportation was just less than fifteen million dollars, which accounted for 27% of running cost of fleets all over the world. Today through improved management and more balanced trades, we see the costs of running empty containers at about a third of what it was in 2003, but this remains a huge cost for the Liner companies to try and address.

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3. Transformation is Necessary

One of the main reasons that complicates the decision making process is the increased availability of ships with the large capacities which has reshaped the transportation network to a hub-and-spoke model and this has increased the quantity of containers transported to main ports. It is commonly understood that World trade faces imbalance, which further causes movement of empty containers. In 2003, container traffic, from Asia to Europe, increased ten times more than the back haul. In 2004, about half of transported containers to Northern Europe, returned empty and as such, the existence of an empty container route to China.

It takes a repositioning coordinator several days to find a solution to a repositioning scenario by hand. Coordinators create a repositioning plan through a trial and error approach which relies on the experience and deep domain knowledge of the coordinator to find a suitable plan. Typically coordinators have no optimization skills. This leads one to realise that with such an important COST element in shipping, liners needs to find the capabilities to OPTIMISE reposition of empty containers quickly and smartly.

A repositioning plan needs to take into account the whole coordination of routes as well as container distribution among all cargo ships across all networks, followed by the costs of each of these routes, taking these into account liner companies can obtain the most cost effective plan to reposition empty containers with the shortest transit times to reposition the equipment, which is of utmost importance to increase the utilization of the fleet.

“Fleet managers should be able to create a full deployment plan quickly”

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In order for Liner companies to achieve better utilization with reduced turn around times, the following steps can be introduced.

- Advanced analytics should consider customers cargo bookings to be able to determine an optimized plan for container deployment.

- Fleet managers should be able to create a full deployment plan quickly taking into account all of the key factors, including the capability to cope with both hard and soft constraints, that are required in order to be sure of an optimized redeployment and repositioning plan.

Manual repositioning plans and container fleet steering are no longer able to cope with the huge number of variables that need to be taken into account.

Therefore one needs to find a solution that takes into account all of the key aspects, including liner shipping service construction constraints, cargo flows, empty equipment repositioning, cabotage restrictions, any sail-on-service opportunities, and maximizes the profit earned during repositioning. Always seeking to deliver a repositioning plan that repositions the equipment fastest and at the lowest cost achievable.

![Graph showing logistics cost as a share of GDP](image)

Source: World Bank for GDP Data. Various sources for Logistics Costs

4. How better results can be achieved?

One of the major components of operating cost for the liner shipping company is the cost of repositioning the empty containers from a surplus location to a location, which is in Deficit. To reposition the containers the shipping line incurs costs such as loading, transhipment, haulage, Feeder, container detention, and discharge cost. In addition, one needs to consider the additional bunkers that are burnt to reposition the equipment.

An Empty Reposition Optimization system needs to identify the equipment imbalance spread across various locations and create a repositioning plan with Minimal Cost and Time. Based on the real-time import and export counts, the imbalance conditions are calculated.
5. Features Need to be Considered

The following features need to be considered when choosing such a system:

- Real-time imbalances calculation: Real-time calculation of equipment imbalances across various locations.
- User Defined and Configurable Reposition Rules.
- Reusing the existing data for route creation and cost calculation.
- Global Visibility: View imbalance status for each location visually on a map.
- Forecasting: Forecast supply and demand using the past data.
- Least Cost and Time: Use of a powerful optimizer engine to calculate the least repositioning cost and transit time, quickly.
- Graphical Representation of moving a box from surplus to deficit location by cost, volume and region wise.
- Least Cost Extraction: Comparing and extracting minimum cost with respective to the planned container moves.
- Allocation Forecasting: Simulating possible allocation of containers from surplus to deficit location.

But optimization technology is only part of the solution to achieve real-world cost reduction in transportation. Equally important is the ability of the solution to fit your processes and to handle the fast-paced world of your sales and service team. Your planners need the ability to review optimization results quickly, modify them easily and re-optimize periodically – all while releasing work orders ready for execution.

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6. Impact on the Bottom Line

Asset utilization should be at the forefront of every shipping line stakeholders mind. Done well a liner company can reduce its fleet and still remain highly profitable. By employing a system support structure such as the SVM ERO from Solverminds, a company can improve the utilization of the container, improve customer satisfaction and actually reduce cost exponentially. By marginally improving the utilization of a shipping container, shipping lines can save millions of dollars, not only from direct cost, such as saving on bunker and landside cost, but allow a shipping to do smarter and more profitable business with the same or reduced fleet size. However, these tools must be combined with careful execution, since container utilization is actually a tension point between operations.
7. Conclusion

Invest in analytics, not additional fleet and equipment. Dedicated analytics can help senior managers understand the financial impact of both high-level issues including corporate strategy and pricing. Analysts can also help with tactical issues including network design (utilization, vessel deployment, string strategy); terminal productivity (port bottlenecks, terminal operations); bunkers (speed profiles of vessels, optimal speeds), and market intelligence and forecasts (industry-wide utilization on given trades, rate trends, mid- and long-term outlooks). SVM ERO has been developed with all this in mind and can be invaluable to insuring the bottom line stays in the green and customer satisfaction improves dramatically.

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