



OPTIBOX

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**THE GLOBAL NEED FOR EMPTY CONTAINER
OPTIMIZATION AND HOW AI MEETS THE NEED**

www.lineroptimizer.com

Empty repositioning from a surplus location to a deficit location is the fourth biggest expense in the liner industry, only preceded by bunker, terminal and charter hire costs. The costs associated with the movement of laden containers are covered by the consumer; however, the movement of empty containers is solely on the liner company.

There is a growing need for an optimized container repositioning solution that can identify the various equipment imbalances around the world, as well as what the next few weeks ahead look like with regard to the container stock at a location. This solution will also need to cater to projected exports and identify the most direct and cost-effective route to reposition surplus containers to deficit locations. It all must begin with an overall view at the time of budgeting transitioned through forecasting and then execution to minimize costs and improve profitability.

The Current Landscape of Shipping Liner Organizations

Liner organizations around the world are challenged with the constant need to meet a dynamic, fluctuating cargo demand with a limited and dispersed supply of containers. Compound that with the ever-rising cost of operations, infrastructural hiccups, and growing operational inefficiencies, such as manual planning with outdated systems, and you'll see why the need for optimized empty container repositioning is a management-level concern.

Bloated container stock levels, high storage costs dictated by commercial demands, high maintenance and repair costs, and lack of clarity around future demand and supply is further aggravating indecision around purchase, sale, lease or sub-lease.

If liner shipping companies hope to remain competitive, operationally agile, and financially stable, they need to turn to technology to guide them successfully into the future.

How an Empty Container Repositioning Optimizer Could Benefit Operations

- Provides a global view of imbalances and repositioning plans catering to best contributing cargo
- Reduces empty container storage costs through a planned evacuation plan
- Gives control over repositioning costs
- Improves asset utilization through reduced container idle time
- Identifies opportunities of one way lease boxes with other box lessors, thus reducing the inventory.
- Reduces bloated stock inventory levels to an ideal stock level
- Lowers maintenance and repair (M&R) costs, by identifying depots with least M&R costs.
- Minimizes the base on/off-hire costs by identifying the most appropriate location where containers can be dropped off or picked up
- Reduces the turnaround time of containers, thereby increasing container velocity
- Rather than making a regional decision of repositioning, a global decision of repositioning brings the overall cost of repo down.

Solverminds Releases AI-powered OptiBox for Enhanced Container Utilization

Solverminds - the providers of the maritime Enterprise Resource Planning (ERP) system trusted for years in the shipping industry - has launched its solution to the empty container repositioning conundrum: OptiBox.

OptiBox is powered by Optimization algorithms, artificial intelligence (AI), and Time Series forecasting. It automatically balances equipment inventory, provides forecasts using time-series models, identifies seasonal patterns, has built-in alerts and notifications, identifies optimal container stock based on demand, and automates route generation for all port pairs. It also provides what-if scenarios to calculate outcomes based on variables that fall outside of typical constraints and optimizes account management and cost reporting.

How OptiBox Repositions Empty Containers Optimally

With the primary objective to minimize global empty repositioning costs, OptiBox creates a plan that repositions empty containers from surplus locations to deficit locations. At a high level glance, OptiFleet considers external data, filters it through business rules and master data management rules, and then applies demand forecasting modeling.

External data

First, OptiBox looks at historical data, such as n-weeks' records, equipment management system (EMS) container routing, and index costs, container on-hire / off-hire system. It also includes container maintenance and repair data with container storage records to gain costing information. Finally, it considers the network of vessel schedule system data, so that the job order of empty loading on a specific vessel or voyage can be provided.

Business rules and master data management configuration

OptiBox aligns this external data with existing constraints, such as port pair quantity, transit days, trans-shipment port, port rules, hard rules, equipment hiring limits, business rules, and seasonality. It also takes vessel capacity constraints into account - both TEUs and weight - as well as factoring in routing limitations, transit time constraints, empty on-hire and off-hire, as well as one way leases.

It also includes master data management such as handling, haulage and feeder costs, transit time profiles, depot storage and handling costs, routing data, as well as container repair costs.

Demand forecasting and modeling for global equipment imbalance

This layer of OptiBox calculates forecasts for laden and empty containers, global equipment imbalance status, and budgets. To build the forecast, patterns based on past profile of the various activity moves are done for each port and equipment type. Additionally, for each port and equipment type a safety stock is defined.

Optimized results

From this, OptiFleet runs an optimizer engine based on the imbalance status data of equipment type at each port. An optimized plan is created that repositions surplus containers to locations with deficits, ensuring that repositioning costs are minimized and at the same time various constraints and business rules are satisfied globally.

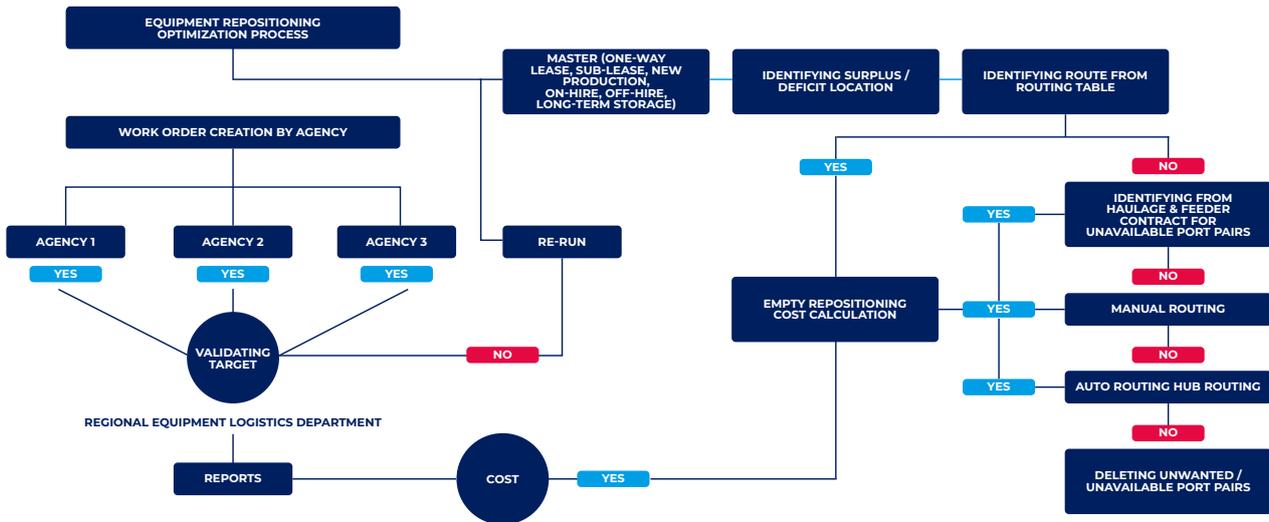


OptiBox auto-computes imbalances based on equipment moves as received from the equipment control module. It calculates equipment imbalance and displays this data visually and geographically for global reposition planning. OptiBox estimates repositioning costs in advance for budgeting and best-cost control, and forecasts supply and demand conditions in multiple locations at once. It also analyzes variances and makes effective, proactive decisions for future optimal repositioning.

It also supports accurate decision-making around on/off-hire, sale or purchase decisions, reduces storage costs, as well as maintenance and repair costs, and depot services costs, and allows users to define rules based on business requirements. From this a repositioning work order can be created.

Optibox has a “whatif” simulation function. This allows the users to input their specific conditions, scenarios, and business rules, and then run the optimizer to see what the financial impact and equipment availability will be for each scenario. These “whatif” scenarios can then be compared against the repositioning output that has been generated by the global optimizer, where the differences will be highlighted.

A plan is as good as plan, till it is not executed in the similar manner, the optibox has functionality to see “Plan vs Actuals”, where the planned repositioning can be compared against the actual repositioning, and variations can be identified.



OptiBox is backed by **SEDGE** technology, it includes data cleansing, data munging, statistical analysis, data exploration, Time series forecast, Seasonal Trend and predictive analytics.

Dynamic Routing and Cost Calculation

The system identifies all the cross-joins between surplus and deficiencies with all possible combinations. Once a port pair is identified, it generates the best route within the existing restrictions.

Location	Count	AEJEA	AUGLT(HR)	AUMEL(HR)	CNCAN	CNQDG(OW)	CNSHA	CNSHA(OW)	FJLTK	INMAA	INTKD	PGLNV	THLCH(OW)
AUTSV	614	1503	XXXX	XXXX	XXXX	XXXX	1006	XXXX	924	1494	XXXX	835	XXXX
BDCGP													XXXX
BEANR													XXXX
CATOR													XXXX
CAVAN													XXXX
CLSCS													XXXX
CNBHY													XXXX
CNBH													XXXX
CNBJO													XXXX
CNCAN													XXXX
CNCGS													XXXX
CNCHQ													XXXX
CNCKG													XXXX
CNCNH													XXXX
CNCSX													XXXX
CNCZX													XXXX
CNDAL	471	XXXX	XXXX	XXXX	XXXX	XXXX	239	XXXX	345	XXXX	XXXX	315	XXXX
CNDLC	64	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	554	2202	XXXX	460	XXXX
CNFOC	60	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX

It then calculates the total costs involved in moving a container from point A to point B, in an optimized routing plan, such as on-hire and off-hire cost, load cost, local trucking cost (origin and destination), feeder cost, haulage cost, depot handling cost (origin and destination), discharge cost, and trans-shipment load costs.

Route Generation Flow

OptiBox generates a route based on customer demand and proforma generation. This can be appended to the base route itself.

- Routing master - Identifies the existing available routes
- Haulage contract - Identifies the existing haulage contracts
- Feeder contract - Identifies the existing feeder contracts
- Hub route creation - Connects with the nearest seaport
- Auto-route creation - Connects with the nearest inland location
- Distance route finder - Identifies the distance between two locations

Rocket-science that is easy to use

The technical ability of this cloud-based AI-powered platform is incredibly complex and robust. However, OptiBox does all of its calculations out of sight, in the background. From a usability point of view, OptiBox is such an easy-to-use platform, liners don't have to hire a team of data scientists to use it or to optimize their repositioning plans.

Rather, with a few simple clicks, their existing operations teams can gain the benefit of data science, and the value and convenience of cloud-based AI technology, without skipping a beat.

For more media information, please contact:

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ABOUT SOLVERMINDS

Established in 2003, Solverminds is a leading next-gen global technology company with a vision to empower businesses with innovations reimagined. Our exceptional domain expertise and cutting-edge technology solutions offer a complete range of best-in-class products for liner operations management, ship management, agency management, and advanced analytics.

While our technological focus is on delivering reliable, resilient, and robust solutions that embrace Artificial Intelligence (AI), Machine Learning (ML), Predictive Analytics, and Big Data, our strategic focus remains on quality and customer-centric approach, research and developments, and thought leadership.

Solverminds is a smart and sophisticated technology provider of a wide range of solutions and services that enfold integrated and bespoke ERP, global consulting, cloud system, and advanced analytics. We help you ascend the ridges of the extremely competitive current world by automating your business processes while offering actionable insights, predictive outcomes, and optimized solutions to make informed decisions.