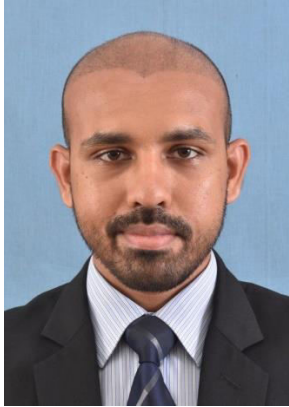


# **An Algorithm to Reduce Container Reposition Cost through Virtual Container Yard**



**By Hansa Edirisinghe**

## **Virtual container yard**

Container inventory imbalance causes a substantial cost to carriers amounting to twenty two percent in the overall cost structure of containers. The most popular mechanism to overcome this problem is the repositioning of empty containers from the idle location to other locations where they are in demand. Also, there is no commonly accepted standard system to minimize the idle time of empty containers at storage. The virtual container yard (VCY) is a novel strategy underpinning the container interchange between carriers that could substantially reduce this ever-increasing container empty repositioning cost. And it ensures maintaining a balanced container inventory in a port through interchange between carriers. The VCY became a popular topic in the literature in the current decade as the alternative methods such as foldable containers did not prove expected results. This paper considers the operationalization of the VCY through the context of computing and information communication technology (ICT).

Although container interchange is not yet a popular mechanism, shipping lines used to interchange their ship space (slots) since last three decades. When CSL realized that they should collaborate to fill their ships they formed strategic alliances, but it took considerable time to form shipping alliances and exchange slots. Slot exchange became a buzz word in the container shipping industry years later after the economic benefits it offered were realized and understood. However, since the container exchange is perceived as a complicated mechanism the decision to exchange containers needs a serious evaluation of its pros and cons in every individual case. This obviously involves many decision parameters. Therefore, the authors believe that ICT could bridge this industry gap and facilitate most effective and economical decision to exchange containers. Accordingly, his paper discusses the possibility of deriving a VCY solution through an algorithm.

## **The concept of algorithm**

Algorithms have been used to aid decision-making for centuries and pre-date computers. Algorithms need data, and their effectiveness and value tend to increase as more data are used and as more datasets are brought together. In this scenario, there is no one correct solution, but there is a best possible solution, depending on what you want to achieve. Also, there are multiple ways to approach the problem, based on what strategy you choose to have for your game play. Think for a moment about how an organization makes a decision. First come the facts, the data that will inform

math destruction” that simply reinforce existing biases and disparities under the guise of algorithmic neutrality (Smith, 2018).

The implementation of the virtual container yard will be influenced by six key factors, namely complexity, attitudes, stakeholders, legal, organization and decision. Since the virtual container yard could reduce overall shipping costs, it is vital to examine the carriers’ perception of this concept (Edirisinghe, et al., 2019a). Container shipping lines (CSL) interchange ship space (slots) to gain the advantage of economies of scale. However, they do not interchange containers at present according to industry sources. Mutual agreements exist between CSL for collaborative activities and these agreements cover various activities, inter alia, container interchange; although it does not happen (Edirisinghe, et al., 2019). Carriers may be interested if the benefits of exchange are quantified in financial terms. One way to look at this requirement is to measure the cost of exchange as perceived by the individual carrier. The study may develop potential parameters that carriers consider as costs. Thereafter any shipping line may be able to calculate own cost of exchange independently. Since each carrier has their own costing, operational, and marketing strategies the values of these parameters may be unique to each carrier. This needs a unit of measurement to quantify the individual cost. Similarly, the lines may look at the actual benefits that they derive from the exchange. If the quantified financial benefits supersede the cost of exchange the decision is very clear.

## References

- Edirisinghe, L., Jin, Z., Wijeratne, A. & Mudunkotuwa, R., 2019a. Mitigating the Cost of Empty Container Repositioning through the Virtual Container Yard: An Appraisal of Carriers’ Perceptions. Tokyo, Japan.
- Edirisinghe, L., Jin, Z., Wijeratne, A. & Mudunkotuwa, R., 2019. The Virtual Container Yard: Identifying the Persuasive Factors in Container Interchange. Tokyo, Japan, World Academy of Science, Engineering and Technology (WASET), pp. 836-846.
- Edirisinghe, L., Zhihong, J. & Wijeratne, A., 2015. Evaluation of Expected Payoff Through Container interchange between shipping lines: a solution to container inventory imbalance in Sri Lanka. *Int. J. Logistics Systems and Management*, 21(4), pp. 503-533.
- Learneroo, 2019. [www.learneroo.com](http://www.learneroo.com). [Online]  
Available at: <https://www.learneroo.com/modules/106/nodes/564>  
[Accessed 01 06 2019].
- Mankins, M. & Sherer, L., 2014. A Process for Human-Algorithm Decision Making. [Online]  
Available at: <https://hbr.org/2014/09/a-process-for-human-algorithm-decision-making>  
[Accessed 01 06 2019].
- Smith, A., 2018. [www.pewinternet.org](http://www.pewinternet.org). [Online]  
Available at: <https://www.pewinternet.org/2018/11/16/attitudes-toward-algorithmic-decision-making/>  
[Accessed 02 06 2019].

### *About the first Author*

**Hansa Edirisinghe** obtained his MSc in Information Technology from the University of Cardiff Metropolitan, UK after completing BSc (Hons.) in Computing awarded by the University of Portsmouth, UK. He presently reading for his Master of Philosophy in ICT offered by Sri Lanka Institute of Information Technology (SLIIT). He carries ten years industry experience in computing and ICT and presently attached to the Board of Investment (BoI) Sri Lanka as information Technology officer.

### *This article was co-authored by Dr. Lalith Edirisinghe and Gajhanan Vettivel*

**Dr. Lalith Edirisinghe** has a PhD in Transportation Planning and Logistics Management. After joining Ceylon Shipping Corporation as a Cadet in 1981 he now carries 38 years industry experience in shipping and logistics. He is presently working at CINEC Campus as the Dean of Faculty of management Humanities and Social Sciences.

**Gajhanan Vettivel** is reading for MBA (PIM-SJP) He has a Master of Information Systems Management (CBO) and has experience in Systems Administration / Engineering. He is the Network Administrator and Instructor at CINEC Metro Campus and helps ensure the system requirements and aids in a better learning experience for students.