

# The Virtual Container Yard: Identifying the Persuasive Factors in Container Interchange

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**Abstract**—The virtual container yard is an effective solution to the container inventory imbalance problem which is a global issue. It causes substantial cost to carriers, which inadvertently adds to the prices of consumer goods. The virtual container yard is rooted in the fundamentals of container interchange between carriers. If carriers opt to interchange their excess containers with those who are deficit, a substantial part of the empty reposition cost could be eliminated. Unlike in other types of ships, cargo cannot be directly loaded to a container ship. Slots and containers are supplementary components; thus, without containers, a carrier cannot ship cargo if the containers are not available and vice versa. Few decades ago, carriers recognized slot (the unit of space in a container ship) interchange as a viable solution for the imbalance of shipping space. Carriers interchange slots among them and it also increases the advantage of scale of economies in container shipping. Some of these service agreements between mega carriers have provisions to interchange containers too. However, the interchange mechanism is still not popular among carriers for containers. This is the paradox that prevails in the liner shipping industry. At present, carriers reposition their excess empty containers to areas where they are in demand. This research applied factor analysis statistical method. The paper reveals that five major components may influence the virtual container yard namely organisation, practice and culture, legal and environment, international nature, and marketing. There are 12 variables that may impact the virtual container yard, and these are explained in the paper.

**Keywords**—Virtual container yard, imbalance, management, inventory.

## I. INTRODUCTION

**T**HE Virtual Container Yard (VCY) is a concept that explains the container interchange between carriers on a global platform. It refers to an ideal situation in which the container shortage of a carrier is filled by another carrier that has excess container inventory and vice versa. Each carrier has the virtual control of their containers globally and may release them to others only when they are in empty status. The VCY is underlining the principle of maintaining a balanced container inventory in a port through an interchange between carriers. This interchange is possible when there are carriers with deficit inventories while others have excess containers. 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. It was revealed that there has been some ad-hoc interchange of containers between carriers when their exporters erroneously stuffed cargo in other shipping lines' containers. However, such interchanges were done as a corrective measure for a situation only, on a case-by-case basis. Since there is no regular practice of interchanging containers between carriers, they are unable to reduce the cost of empty repositioning of containers. The ultimate result being that they never opt to strike a balance between the container inventories, even within active consortiums (alliances). Therefore, it is obvious that the behavioural patterns of carriers with respect to these two phenomena (i.e. sharing ship space and pooling containers) are not the same.

Containerisation has changed everything in the world; it expedited the globalisation through efficient and economical sea transportation. It helped intermodal transportation through efficient and cost-effective cargo handling. Global statistics reveals that there are 6,144 active ships (including 5,290 fully cellular) that carry 22,835,497 TEU (22,434,931 TEU fully cellular) in sea transport [1]. This concept was the brainchild of American trucking magnate Malcolm McLean [2]. This system has significantly expanded the opportunities for international trade as it holds good characteristics of sea transportation [3] and was developed and first commercially implemented in the US in the mid-1950s [4].

Container inventory imbalance (CII) is an inevitable phenomenon that has a global impact [5] worldwide, empty containers account for approximately 20% of container flows at sea. Controlling logistics costs allows companies to maintain a competitive edge, since lower logistics costs translate into competitive external trade [6]. A mutual relationship among CSLs would improve this problem through the collaborative approach and would positively benefit economies of scale for the entire shipping industry. Collaborative supply chain practices act as important tools to achieve competitive advantage [7].

If transport costs are brought down, the price of goods and services are expected to reduce. Accordingly, the reduction of shipping costs may ultimately reflect on consumer prices. The primary objective of the VCY is to reduce the cost incurred by CSL due to CII. This would help a country to bring down its inflation. Similarly, lower transportation costs can make a country's exports more competitive in the global market. These factors have a direct impact on the welfare of a country.

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