



PORT-CENTRIC CONTAINERIZED LOGISTICS

FROM DISSOCIATION TO REINSERTION

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Containerization has had an enduring impact on the relationships between ports and their hinterlands. These relationships shifted in time with a dissociation in the earlier phases of containerization and the recent phase of reinsertion with port centric logistics (Figure 1). Historically, ports and adjacent areas had a pronounced maritime support function with a clearly defined port district composed of docks, piers, warehouses and other related activities.

These are usually referred as first tier logistics since they are directly related to the support of the port's cargo transfer. Low mechanization levels implied the usage of a large workforce manually handling break bulk cargo. This was a time-consuming process with ships spending a large amount of time at ports; in many cases up to two-thirds of their operational time. Directly adjacent to port districts were the second tier of port-centric logistics, which included warehouses, distribution centers, as well as manufacturing, commercial and financial districts. Inefficiencies in port operations

and throughput were a strong driver for containerization and its diffusion indirectly incited a dissociation between ports and their logistical activities.

Because of the technical requirements of containerization, new port terminal facilities were built at locations more suitable for container operations, particularly those with a more extensive terminal footprint. This by itself incited a physical dissociation of the terminal with local logistical activities which was exacerbated by the substantial decline in port workforce because of mechanization.

Many old port sites were abandoned and converted to other uses (commercial and residential), which further contributed to the dissociation. Port districts were declining in size and importance. Lower inland transport costs and low levels of congestion allowed commercial and manufacturing activities related to ports to be less constrained in their locational choice. Container ports were servicing a wider hinterland, which went on par with trade liberalization and the offshoring of manufacturing activities towards lower

cost locations. While port-centric logistics were being dissociated in older port areas, new forms of port centric-logistics were being created in others. For bulk port activities such as metals and petrochemicals the level of integration did not change much because of high weight to value transport cost ratio for the involved commodities. What changed was mostly the larger scale of these activities, which for some has incited relocation to more suitable sites.

As containerization is reaching a phase of maturity in terms of its spatial diffusion and lower growth rates, a reinsertion of port centric logistics is taking place around many container port facilities. Enduring trade imbalances reflected in container flows require the management and repositioning of empty containers and the related logistics activities. For instance, at gateways with a strong import function, transloading the contents of containers into domestic load units is a notable port centric logistics activity. At export-oriented gateways, warehousing and container stuffing operations are more

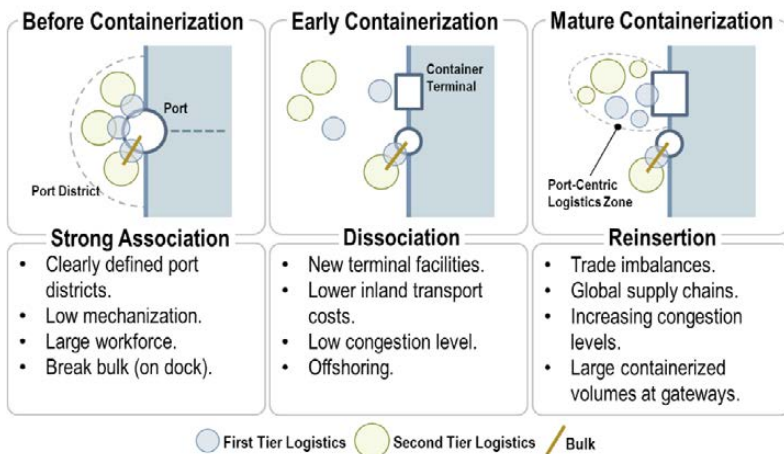


Figure 1: Evolution of Port-Centric Logistics

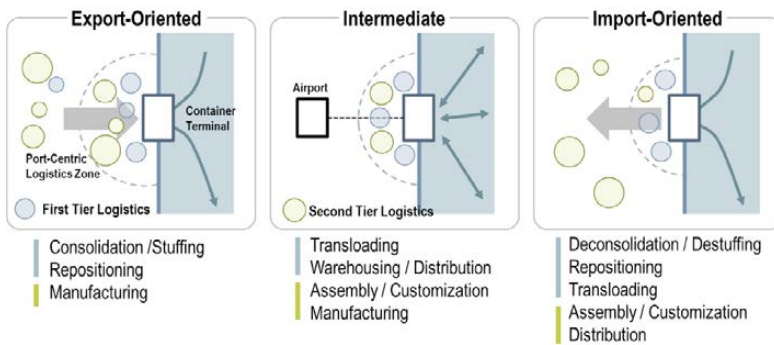


Figure 2: Functional Types of Port Centric Logistics

prevalent. Global supply chains are becoming increasingly complex, which for some sectors incite locating in port-centric logistics zones to maximize connectivity to suppliers and customers that could be shifting due to market, technological or regulatory changes. The impact of congestion is also non-negligible as additional costs, uncertainty and delays could render port-centric sites more suitable than lower-cost inland sites. There is also a scale effect as large containerized volumes handled at major ports increase the commercial appeal of their port-centric logistics sites.

FUNCTIONAL TYPES OF PORT CENTRIC LOGISTICS

Port-centric logistics is not a uniform strategy because it is a function of the position of a port within the global maritime transport system. Three main types of port-centric logistics can be retained (Figure 2). The first illustrates the standard export-oriented paradigm where the container port is the pivot for an export-oriented platform. This is particularly prevalent in East Asia where offshoring has substantially influenced port development towards the setting of large manufacturing clusters. First-tier port-centric logistics are dominantly focused on the consolidation of loads and container stuffing. Since there are more exports than imports (in addition to the different

composition of imports versus exports), an important component of first-tier logistics is the repositioning of large pools of containers between importers and exporters, many of which are empty. Second-tier logistics are oriented along manufacturing activities having a close relationship with the port to provide for their inputs (parts) and outputs (finished products).

The second functional type of port-centric logistics is the least common but represents a valuable proposition in a global economy where the importance of connectivity is increasing. It relates to major transshipment hubs as intermediary locations that connect deep-sea and feeder shipping networks. Notable examples include Dubai, Singapore and Panama. Under such circumstances, the port becomes a distribution platform servicing a region through the stocking of parts and finished goods, as well as assembly, customization services and light manufacturing. New forms of interactions can also take place, particularly when maritime and air cargo operations are jointly used in supply chain management. The joint connectivity of both air and maritime networks creates multiplying effects since there are additional sourcing and distribution options through air/maritime transloading.

The third functional type of port-centric logistics is import-oriented, which is common in North America and Europe. Since

the import retail goods dominates, first-tier port-centric logistics relies on container destuffing and the deconsolidation of loads for specific distribution centers. Like export-oriented platforms, there is an active container repositioning market trying to reconcile inbound and outbound logistics. Transloading is also an important logistics activity with the contents of container load units transferred into domestic units, such as between 40-foot ISO containers and 53-foot domestic containers in North America. Since inbound logistics has a significant retail orientation, second-tier port-centric logistics involves assembly and customization and various forms of distribution, such as fulfilment and postponement.

Port-centric logistics is likely to play a growing role in the future, in part because of changes in the cost structure of manufacturing due to automation and robotization. Under such circumstances, operating freight distribution activities from a port-centric logistics zone has notable benefits in terms of connectivity to suppliers and customers considering unpredictable shifts in supply and demand.

DR RODRIGUE'S PREVIOUS TECH PAPERS

ABOUT THE AUTHOR

Dr Jean-Paul Rodrigue is a Professor at Hofstra University, New York. His research interests mainly cover the fields of transportation and economics as they relate to logistics and global freight distribution. Specific topics over which he has published extensively cover maritime transport systems and logistics, global supply chains, gateways and transport corridors.

ABOUT THE ORGANIZATION

PortEconomics is a web-based initiative aiming at generating and disseminating knowledge about seaports. It is developed and empowered by the members of the PortEconomics group, who are actively involved in academic and contract research in port economics, management, and policy. Since October 2012, Port Technology International and PortEconomics have been engaged in a partnership. www.porteconomics.eu.

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