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PORTS AS INHIBITORS AND ENABLERS OF GLOBAL SUPPLY CHAIN ECOSYSTEMS

NEPTUNE EXCLUSIVE WHITEPAPER



Knowledge for Innovation

EXECUTIVE SUMMARY

There is no question that containerised ocean freight is at the heart of the majority of 21st century global supply chain ecosystems. However, infrastructure, regulatory and operational challenges both within and outside the port frequently result in congestion problems that adversely impact cross-border and multi-modal trade flows, causing delays and additional costs for all the supply chain stake holders.

The container shipping industry continued to develop and expand across multiple dimensions - including traffic volumes, Technologies, vessel design, container handling equipment and scale of operations. Today over 90% of all global trade travels on the water the majority in containers - so any obstacles or developments that impede the timely and cost effective movement of millions and millions of containers could have a profound effect on the health of the world's economies. Container port infrastructure is therefore an essential and critical component that empowers and enables global supply chain ecosystems.

Container ports have developed their infrastructure to become pivotal points in the global supply chain ecosystem, with extensive land-side capabilities including container yards (CY), advanced handling equipment, container freight station (CFS) warehouse facilities and multi-modal transportation linkages.

Although they are often referred to as points of origin and destination, within a supply chain ecosystem, ports are a critical point of transit, rather than a final destination. Goods travel from their origin point of production (typically a factory) – transit through various container ports – to the point of consumption at their final destination, for example a retail store.

Therefore, in the context of the Container Port – above and beyond pure capacity within the port, the network connectivity and overall throughput efficiency are equally important as critical enablers of the supply chain.

PORT OPERATOR ONE OF MANY STAKEHOLDERS WITHIN THE PORT COMMUNITY

As the primary custodian of the container port facility and operations, the Port Operator manages a highly asset-intensive business model, requiring significant capital investment in 'hardware assets' such as land, quay construction, container yard, machinery and handling equipment, not to mention the software aspects of sophisticated IT systems and the human capital resources to manage the whole operation.

However, the port operator is but one player - albeit a critical one - within an inter-dependent network of multiple stakeholders – including the all-important Port Authority or equivalent government body - that together comprise the port community.

As can be seen from the ICF Model, the extended port community (in itself an ecosystem) embraces many organisations and functions that are literally and metaphorically 'outside the gate' of the port terminal – and there-fore beyond the Terminal Operator's direct control of the operations at the port.

However, all these various activities undertaken by the variety of organisations involved, will impact the port's role as an effective and efficient transit point within a cargo owner's supply chain ecosystem. It is essential therefore for all stakeholders within the port community to work in harmony to positively impact the overall performance, economic viability and ultimately the port's economic contribution in the local, regional or national economy.



CONTAINER PORT "OUTSIDE THE GATE"

Increasing need to get containers through the terminal due to larger vessels... But terminal operators / ports only control a small portion of the supply chain links



SUPERSIZED CONTAINER SHIPS

Container ships have inexorably grown in TEU capacity as shipping lines strive to bring costs down by leveraging the latest technology coupled with economies of scale, but Port Operators continue to question the economic and business benefits from the increasingly bigger vessels.

Currently the largest container ships are Maersk Line's Triple E class with capacity of 18,000 TEUs, which are 400 meters long, 29 m wide and have a draft of 14.6 m. 24,000 TEU vessels are currently under construction.

These mega vessels present operational and financial challenges for terminal operators who need larger berths, bigger cranes and deeper water in order to accommodate these huge vessels, resulting in a multi-tier system in which "bigger ships will make fewer port calls".

HOW WILL PORTS COPE?

More and larger vessels coming on stream will result in additional excess capacity, which risks driving freight rates down even further, challenging the financial future of several shipping lines. However, the cascading effect will result in medium size vessels being deployed in smaller trades, with the overall result that even the smaller ports will be expected to accommodate bigger ships.

Container shipping is a capital intensive sector and out of all the fixed assets, the Port is the most fixed of all – the ships can go elsewhere, but the port is stuck where it is – with expansion quite often limited by landside and or waterside constraints. Investing in longer docks, deeper ports, larger container cranes, and the infrastructure needed to store and ship containers in and out of the port can easily run into billions of dollars, not easy to justify at a time of global economic uncertainty.

The big and the brave will make the necessary investments to expand their port infrastructure and capabilities in order to accommodate the largest vessels, but the resulting development of a small number of 'Super Ports' around the world that can accommodate the mega vessels will result in a two-tier system. We envisage the development of hub-and-spoke business models, whereby large volumes of containers are unloaded at the 'Super Ports' for onward shipment in lower capacity vessels for delivery to smaller ports.

The first build of the new 24,000 TEU vessels will be complete in 2016/17, but which ports will be ready for such huge vessels? Only a handful of ports in Europe or even in the Far East will be able to take the new 24,000 TEU ships, and if these ships cannot enter the leading ports, then few more, if any more, will likely be built.

OCEAN FREIGHT: PORTS AS INHIBITORS AND ENABLERS OF GLOBAL SUPPLY CHAIN ECOSYSTEM

PORT RELATED CHALLENGES INHIBITING SUPPLY CHAIN ECOSYSTEMS

Already under pressure from steadily increasing container traffic, more ports are suffering from congestion. The causes are many and varied and there is no simple answer as demand for container shipping will continue to increase and the advent of even larger capacity vessels will make the situation more critical.

Research into the causes of port congestion by Schwitzer & Martens identified numerous non-vessel issues such as poor port management, labour relations, scheduling, loading and unloading procedures and equipment, truck driver shortages, traffic systems, customs delays and pollution issues as inhibitors to smooth transit of cargoes through the port community system.

As discussed, numerous variables can impede the throughput efficiency of cargo transiting through a container port, many of which are outside the direct control of the port operator.

During 2014, the industry has experienced a range of port related challenges inhibiting supply chain ecosystems, including:

ON TIME VESSEL ARRIVAL - average reliability across all carriers in the Asia-Europe trade lane declined from a high of 83 per cent on-time port calls in mid-2012 to just 51 per cent on-time in the first quarter of 2014. If ships arrive 'out of window', then terminal operators may not have the space or facilities ready to receive them, resulting in further delays.

PORT CONGESTION - according to Drewry Maritime Research, the North European ports of Rotterdam and Hamburg are experiencing significant congestion, raising the question as to whether port congestion problems are just temporary, or indicative of a new paradigm for the industry? The current congestion difficulties of Rotterdam and Hamburg are partly because terminal capacity is being affected by work to upgrade existing facilities.

LARGER VESSELS - in general, terminal capacity continues to be constrained by much greater peaks in volumes created by larger container ships. In Hamburg, the increased volume peaks caused by larger vessels, coupled with schedule reliability issues, have reportedly caused a doubling of average dwell times for export containers.

In **NIGERIA**, a paper recently presented at a Nigerian Shippers Council (NSC) organised conference in Lagos reported that not less than USD 16 billion is lost annually due to congestion at the nation's ports. The lead panellist said that the high level of physical inspection of goods at the ports has led to huge revenue losses for the government. The consultant identified some of the challenges hindering the efficient clearing of goods through the ports, including shuffling of papers back and forth by officers of Nigeria Customs Service (NCS), the manual handling of documents and lack of infrastructures to attract the investors that government desires.

The Lagos State Government says it allegedly lost one billion US dollars as a result of the poor traffic to and from Nigeria's premier and busiest port, Apapa Quay in Lagos. Giving an insight to the loss, the state government said maritime traffic contributes over 70 percent of these losses.

In **CAMEROON**, congestion at Douala Port has continued to build this year, with operators reporting that containers on the ground at the port had reached a critical amount and were jeopardising vessel operations; full vessels were waiting at anchorage, with very slow productivity at the port; and an approximate three to four-week delay to berth. This situation was said to be affecting the entire port of Douala, with all shipping lines facing delays. With vessel delays now reaching 28 days, CMA CGM has introduced an emergency port congestion surcharge (EPCS) from August 2014 on shipments to Douala, ranging from \$270 per teu from Europe, Mediterranean and Red Sea, to \$300 per teu from Asia, the Middle East, Gulf and India. OCEAN FREIGHT: PORTS AS INHIBITORS AND ENABLERS OF GLOBAL SUPPLY CHAIN ECOSYSTEMS

EXCLUSIVE STUDY

In the **PHILIPPINES**, this year's truck ban in downtown Manila has reduced access to the port resulting in bottlenecks at the regularly congested Port of Manila (POM) - which handles around 65% of the country's cargo where incoming cargo boxes are now being delayed for an average of 10 days. The impact reaches far beyond cargo delays and port congestion - according to the Bureau of Customs, the truck ban led to a 1.4 percent drop in Philippine exports - which account for around 30 per cent of the economy - in February 2014. The agency also missed its collection target of 30.2 billion pesos (USD 691 million) for the month by nine per cent. The European Chamber of Commerce said "Drastic and unsustainable operating decisions may have to be taken to further mitigate the impact of the truck ban and keep cargo moving." Sources from the ports said companies continue to suffer from the delays in shipments of raw materials and the export of finished goods with some 7,000 containers still unclaimed or delayed in Manila ports.

On the other side of the world, the **US WEST COAST** ports (USWC) including Los Angeles and Oakland are suffering from a triple threat of labour unrest, over capacity, and possible diversion of containers through the expanded Panama Canal from 2016. Severe competition on the west coast is also pressuring port revenues - according to the Journal of Commerce, "Terminal operators are struggling to keep the rates they charge to carriers at compensatory levels as the large shipping lines and carrier alliances leverage their cargo volumes for lower rates."

From a different perspective, a recent **PORT AUSTRALIA** report highlighted the threat of increasing demand for inner-city residential developments close to areas where port operators may hope to expand. The inevitable disruption and disturbance from a modern 24/7 port may lead to conflict and objections when port and transport operators look to expand their operations or extend their activities. Per -

AN AGILE INDUSTRY RESPONDS - PORT INITIATIVES THAT ENABLE SUPPLY CHAIN ECOSYSTEMS

It's not all doom and gloom as many port communities, governments and terminal operators have the vision and confidence – and funding - to develop their facilities to run effective port operations, expand facilities and in turn attract and encourage new business.

Container ports in **CHINA** hugely dominate world container traffic with seven ports in the global top 10 – together handling over 140 million containers in 2013 - and their dominant position is unlikely to change within the foreseeable future, due to continuing expansion of China import-export trade flows and massive infrastructure investment. Just in the last decade, capacity at the Port of Shanghai has increased dramatically from 14 million TEUs in 2004 to more than 33 million teu's today. The rapid expansion was largely due to the construction of the Yangshan Deepwater Port, 30 kilometers offshore, which opened in 2005 and can handle the world's largest container vessels. The Yangshan facility alone can handle over one million containers per month.

However, ports in other parts of the world are also taking positive steps to improve capacity and performance.

The **US GULF** ports including Miami, New Orleans, Mobile, Savannah, Houston and Everglades are seeing their containerized cargo benefiting from some north-to-south shift in US population, growth in the region's automotive and chemical industries and investment in container-handling facilities. While their individual container traffic levels are very modest compared with many Asian and European ports, their collaborative 'Port Cluster' approach to working together, whist investing in expanding capacity throughout the gulf area, is designed to take advantage of further expansion in US international trade.

In the **UNITED KINGDOM**, the new DP World London Gateway development is a great example of a fully integrated Port Community, combining road and rail linkages, container traffic flows and port-centric logistics facilities - all on a single location. With 3.5m TEU capacity, more than 800,000m² of warehousing and an eight lane highway, London

Gateway has the potential to become a major player in the north-west Europe region.

In addition the UK's once dominant Port of Liverpool is planning to regain some lost ground with a USD 500 million investment in a new port project that will allow larger ships to dock in Merseyside and create the Liverpool2 container terminal at Seaforth, opening in 2015, doubling overall capacity to two million TEUs. Currently restricted to accepting ships with less than 3,500 containers, Liverpool2 will allow vessels carrying up to 13,500 containers to call at the Port of Liverpool.

NEPTUNE EXCLUSIVE STUDY 11

INNOVATIVE CASE STUDY IN INDONESIA - CIKARANG DRY PORT

An innovative and exciting port solution for ocean freight supply chains has been implemented in Indonesia - the largest economy in South East Asia and growing at 5 per cent plus, a G20 member with population over 250 million and a one trillion dollar economy. Cikarang Dry Port is an inland dry port model that is providing an efficient and effective solution to chronic congestion and delays at the major import export gateway of Tanjung Priok.

Located on Java island, just 50 km from Jakarta, Cikarang Dry Port serves as an extension of the major Tanjung Priok gateway sea port and provides integrated port and logistic facilities with on-site customs and quarantine inspection services, operating 24/7.

Strategically located in the heart of the largest manufacturing zone of Indonesia along the Bekasi-Cikampek industrial corridor on the east side of greater Jakarta, Cikarang Dry Port is surrounded by some 12 industrial estates containing over 3,000 manufacturing companies, many of them importers and exporters.



Figure 2: Cikarang Dry Port

The first and only Integrated Customs Services Zone in Indonesia, Cikarang Dry Port occupies 200 hectares of land, including capacity for an extensive logistics park, and enjoys multi-modal hinterland connectivity through its direct access to highway and railway networks.

With all forecasts indicating continuing growth of the Indonesian economy, which of course will result in increased container flows, this innovative Cikarang Dry Port solution is enabling and empowering efficiencies in the flow of goods that save money and time for stakeholders throughout the supply chain ecosystem.

CONCLUSION

Shipping lines and container ports have been at the epicentre of the exponential growth of international trade in an increasingly globalised world. Despite the many and varied constraints, continuing innovation and investments in hardware and software by port community stakeholders has ensured the ongoing development of infrastructure and related services to optimise port operations and their role as transit gateways - through which cargo travels on its journey through the customers supply chain ecosystem. While today's challenges will need steady nerves and considerable investment, there is every reason to believe that the industry will continue to thrive and meet the demands of the global economic community.

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Mark Millar leverages 25 years global business experience to provide value for clients with informed and independent perspectives on their supply chain strategies in Asia.

His 'Asia Supply Chain Insights' series of presentations, consultations, whitepapers, corporate briefings and seminars help companies navigate the complex landscapes in China and ASEAN, make better informed business decisions and improve the efficiency of their supply chain ecosystems.

Acknowledged as an engaging and energetic presenter, clients have engaged Mark as Speaker, Moderator, MC or Conference Chairman at over 300 events in more than 20 countries. Mark is a Visiting Lecturer at Hong Kong Polytechnic University and has delivered Guest Lectures at Georgia Tech (Atlanta and Hong Kong), RMIT (Ho Chi Minh City) and SP Jain (Singapore & Dubai). His industry contributions have been recognised with a number of accolades, including being named in the "Who's Who of Power Players in Supply Chain Management in China", the "Pro's-to-Know Thought Leaders in Supply Chain" and as "One of the most Progressive People in World Logistics".

London based business publisher Kogan Page have recently commissioned Mark to write the book entitled "Global Supply Chain Ecosystems", due for publication in 2015.

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Industry thought leader Mark Millar has been engaged by clients as Speaker, MC, Moderator or Conference Chairman at more than 250 events in 20 countries and is recognized by the Global Institute of Logistics as "One of the most Progressive People in World Logistics"

