

Service logistics

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**What are the multi modal transport and its uses to logistics
development at the global context.**

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Abstract

This report will discuss the uses of multi modal transport in a global context. Firstly, it will define the subject, secondly, it will describe the facilities which make the multi modal transport to do. Finally, it will describe the development of global multi modal transport.

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Introduction

“Multimodal transportation refers to movement of cargo by more than one mode of transportation.” (Sinha, 2019). Another usual term is inter-modal transportation.

Multi modal transport appears early with the creation of boats which could transport many merchandises to a port and gives the relay at horse-drawn carriages to deliver small parts of shipment in several points. Later, the technology innovation improves and increase the possibilities of multi modal transport with the train in the 19th century, after, the appears of carriers and air cargo in the 20th century for goods transport (Briceño, 2019).

The innovation that has made the most advance multi modal transport is the container which was created in the 1950s. Throughout the years the container was becoming a standard and a norm in every country for international transport. The rise of the container had to start at the end of the 20th century with globalisation and exchanges between developed countries. Moreover, it had increasingly evolved with the container ship which is bigger and bigger. Nowadays, the worldwide capacity of containers reaches 148 million and its increase each year due to the demand (World shipping, n.d.).

Globalization has pushed to the development of international connections between countries and continents hence the creation of hubs was necessary to increase the efficiency of the supply chain.

Therefore, the hubs started to appear, it is an area where merchandises are gathered and where they could change of type of transport. Connected to these hubs there are smaller areas called the spokes that where comes from “hub and spoke”. Started to the hub merchandises are scattering in different regions and goods could be transferred from a type of transport to another for example a container that comes from a ship to a train or to a carrier (Nahálka et al., 2017).

The first part of the report defines the multi modal transport and describes how different type of merchandises could be transported. The second part, discuss of the use of hubs and other equipment as rolling highway and containers. The third part explains how integrators use multi modal transport and the example of the Belt and Road Initiative shows the international connections through transport.

1. Multi modal transport

1.1. Definition

“Multimodal transportation is interpreted as door-to-door transportation of goods by several modes of transportation with intermodal loading units” (Sinha, 2019).

Multi modal transport is efficient on a long journey. To carry merchandises there are several choices use for multimodal transport like a truck, air cargo, shipper, pipeline and train. Companies choose the good combination of transport according to the type of products (liquid, solid or package goods), if it is high-value merchandise or not, the delivery time and the price of transportation.

1.2. Categories of merchandises

Category	Available transport	Unavailable transport
Bulk (large quantity)	Pipeline (for liquid), train, ship and carrier	Airplane
Break bulk	Train, ship, carrier	Pipeline, airplane
Container/ULD (Unit load device)	Train, ship, carrier, airplane	Pipeline

Figure 1 - Table of type of transport according to the type of product

Every product has its specificities of shape and dimension and could not fit with each type of transport. The easier transported products are in the container because it is faster to change transportation equipment than bulk and break bulk merchandises (Sinha, 2019).

According to their forms merchandises are transported in a different type of trailer, wagon or ship. The liquid is transported in a tanker, break build are usually in the dump and classic merchandises pack in carton and pallet are transported in a container or in a classic trailer.

2. Facilities

2.1. Hubs

Hubs are places where there is much traffic and the possibility to transfer shipment to another type of transport because they have got facilities and equipment. Many ports or railway stations have this capacity like the port of Rotterdam, Shanghai or Singapur, the railway station of Duisburg (Germany) or Xi'an (China).

Moreover, it gives the possibility to gather different merchandises on the same shipment for example in one container to optimize the delivery costs. Therefore, hubs are a gateway that facilitates either the enter into a market place and the way out to export through the transport facilities.

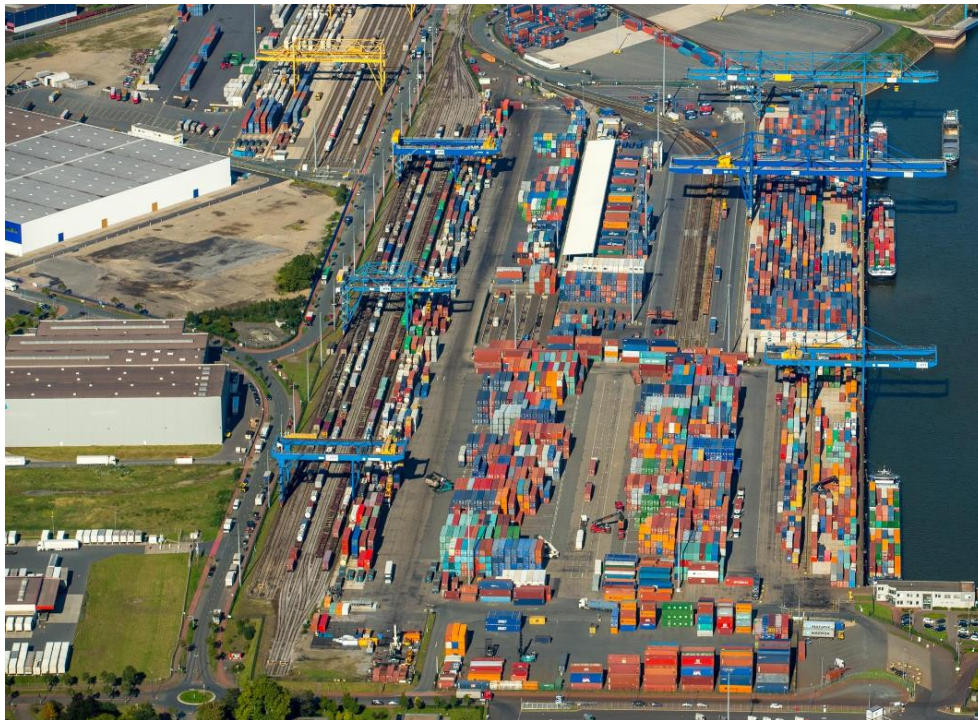


Figure 2 - Hub of Duisburg

For example, the Dubaï Logistics Corridor is an international hub with the DP world port, located a few minutes from the Dubaï cargo airport which is the “eighth busiest cargo airport in the world”. Furthermore, the city is connected to the Al Maktoum International Airport which aspires to become “the first busiest airport in the world”. “The road network exceeds 168,000 kilometres in the Arabian region” and enable carrier merchandises in hinterland cities. A project of the railway network is studied to connected the Dubaï corridor at “the West

of Saudi Arabia, and the East of Oman” with 1200 kilometers of rail. This hub enables to obtain an efficient logistics flow in this area through the different possibilities of transport (Sundarakani, 2017).

The creation of hubs provides several advantages like the decrease of truck miles on their journeys and a reduction of traffic jam on main highways thus result in a drop in pollution due to carbon emission (Lu and al, 2018).

Hubs are necessary to develop the multi modal transport and the economy of countries because it is a place where route in-come for factories and out-comes from themselves to warehouses or final consumers. China recognized this importance therefore in 2013 it planned to create 100 logistics hubs. This strategy aimed to improve the efficiency of flows in the country and ensure smooth flows for the global supply chain (Lu and al, 2018).

Hubs enable to make merchandises bundling from different providers to one customer or unbundling goods from one provider to different customers.

2.2. Equipments

2.2.1. Rolling highway

The rolling highway or rail motorway is equipment that enables combined road and rail transport with any type of trailer or container on the train. Sometimes, it could transport a tractor with the trailer. In North America and some lines in Europe enable to transport stack containers when facilities are enough high (Wikipedia, 2021).



Figure 3 - Rolling highway

This type of multi modal transport enables to transfer of merchandises on a different type of transport and not needed to handle it, therefore, it is a gain of time and it reduces damage risks. Furthermore, it enables to reduce the cost of transport with the economy of scale on the train rather than truck, improve the time of delivery and decrease the gas emission due to road transport.

2.2.2. Full Container Load (FCL) / Less Container Load (LCL)

The FCL contract is used to deliver a complete container at a destination or directly to the customer. The LCL contract is used when the container is not complete and enable to place of merchandises from other companies to complete it. The LCL optimize the capacity of transport and reduce cost and delays for each company (Icontainer, 2019).

Furthermore, when a customer has few providers an LCL/FCL contract could be arrived at the bundling point by truck and train and load in the container which will be transported by container ship in another country (Icontainer, 2019).

For example, the production of the Iphone requires many pieces which come from different providers in Malaysia. Components are delivered in the same port by several factories before their shipping in China to be assembled.

These FCL / LCL contracts take part of the global supply chain because these transport are usually international and multi modal when the journey requires two or more type of transport like road, water or rail.

3. Actors and development

3.1. Integrators

“Integrators are shipping carriers that control complete air and road delivery networks and offer a wide range of package delivery services.” (Malighetti and al, 2019).

Their activities increased with the globalisation and the exponential growth of the E-commerce sales and the fast delivery offered by websites like Zalando, Ali Express or Amazon.

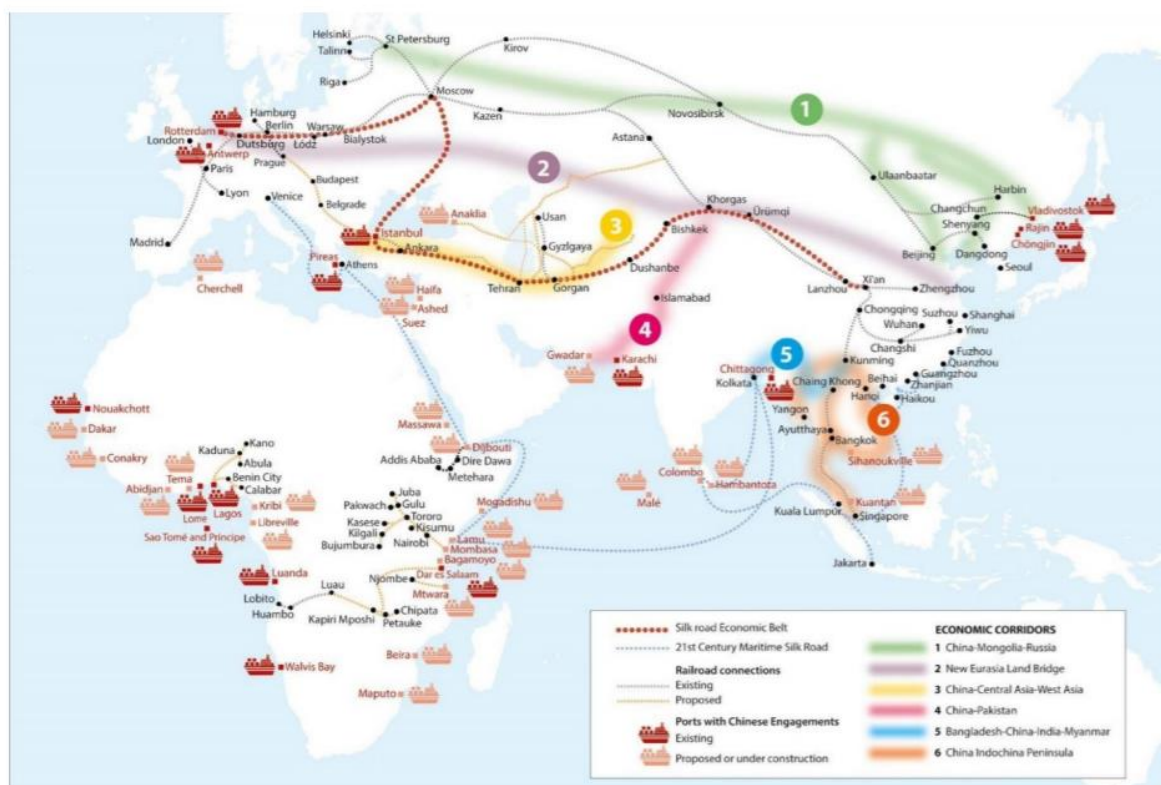
Integrators as UPS, FedEx and DHL manage all the logistics process between the seller and the customer. These companies are able to offer fast deliveries because they have got many cargo

aircraft and many trucks in a lot of countries. They use multi modal transport and air hubs to centralize merchandises and transfer shipment from aircraft to a truck as soon as possible (Malighetti and al, 2019).

Integrators services are more expensive than transport by container ship or railway because they use aircraft which operation service cost is higher and the delivery time is faster.

3.2. Belt and Road Initiative

The belt and road initiative is an example of global multi modal transport. This Chinese project connects African, Asian and European continents by road, rail, pipelines and water transport with the aim to be provided raw materials and deliver merchandises produced in China. This project will improve connectivity between more than 60 countries and facilitate exchanges with international logistics infrastructure (The guardian, 2018).



Source: OECD research from multiple sources, including: HKTDC, MERICS, Belt and Road Center, Foreign Policy, The Diplomat, Silk Routes, State Council Information Office of the People's Republic of China, WWF Hong Kong (China).

Figure 4 - Land and maritime roads of Belt and Road Initiative

This map reference main roads which are already available, being built or in the project. We observe that in East of Africa, products would transport by train or truck before a departure for Asia or Europe by ship. On the easter coastline of China and Corea, there are two main

roads that start from maritime hubs and pass through all Asian and European continent to finish at St-Petersburg (Russia) or at Duisburg (Germany) by train.

The French company Decathlon, which sells sports equipment was using one railway of the Belt and Road Initiative since 2017. The train starts from the Wuhan station and arrives at the Duisburg hub in 20 days than 41 days than container ship, moreover, it reduces by 40% the carbon emission. The 41 containers are unloaded from the “train block” when they arrive at Duisburg to be transferred on a truck for delivery at Dourges in France (Stratégie logistique, 2017).

Since 2017 Decathlon usually transports its shipment with train and multi modal transport. Henceforth the company use the fluvial transport between the Duisburg station and its logistics platform in Dourges to decrease the gas emission (Rognon, 2018).

This new facility of global multi modal transport enables companies to procure their merchandises faster and at a lower cost.

Conclusion

This report defines and explains the functioning of multi modal transport. It shows that it could create smooth flows at the global level with the international multi modal hubs present nowadays. Moreover, international facilities and accommodation created with agreements between different countries like Belt and Road Initiative or the Channel Tunnel for the Eurostar facilitate exchanges.

Therefore, the multi modal transport gives advantages to companies that use this type of transport because they make the economy of scale on long-distance with the use of train or a ship for example. They reduce the delivery time with the optimization of the journey and good choice of type transportation as the example of Decathlon which uses the train for its procurement in China.

Multi modal transport and the use of containers allow reducing the risk of damages on goods because there is fewer handling operations on pallets and merchandises. Containers are easier to change of transport type.

Furthermore, companies that needed fast delivery from international or national could require services from specialists of multi modal transport as FedEx, UPS and DHL. They have got many air and road hubs in the world to ensure delivery in 1 or 2 days. Integrators through the multi modal transport satisfy the requests of their clients and allow them to avoid a lack of stock.

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