White Paper

A Vision for Data-Use in Logistics

1 Executive Summary

What Is the Current Market Situation?

The logistics market is complex with multiple players and a high degree of competition. It is not uncommon for more than fifteen parties to be involved in a single transport leg. The market traditionally fosters a large degree of information asymmetry. Historically, this information asymmetry has aided players to accentuate their added value. They are therefore reluctant to share information by nature, despite them sharing the same ambition and potential benefits from sharing information (service efficiency and reliability improvement for example). However, the underlying organisational interests and risk estimates still provide strategic incentives not to share data. Furthermore, any sharing would also require parties to invest in order to structurally store and release data, which further reduces the prevalence of voluntary data sharing.

We observe that the complexity in the market further increases, especially as sea vessels increase in size – where, with an increasing number of shippers – more cargo is transported through more terminals (with entire country supply chains competing at a country level (e.g. Dar-es-Salaam and Mombassa both competing for valuable Lake Victoria freight business through investment in port and railway chains). The vulnerability of the circuit is thereby larger. In addition, larger vessels lead to more congestion on both water, road and rail as transporters – who travel to deliver or drop goods from terminals in the pre- and post-transport stages – get in each other's way. Terminals are thus increasingly becoming a bottleneck, especially when a vessel's large cargo is not loaded efficiently and therefore prolongs port time. This is one reason why terminals are investing in the terminal haulage model, in which the throughput rate is increased by directly transporting goods to intermodal hubs/terminals in the vicinity of the port.

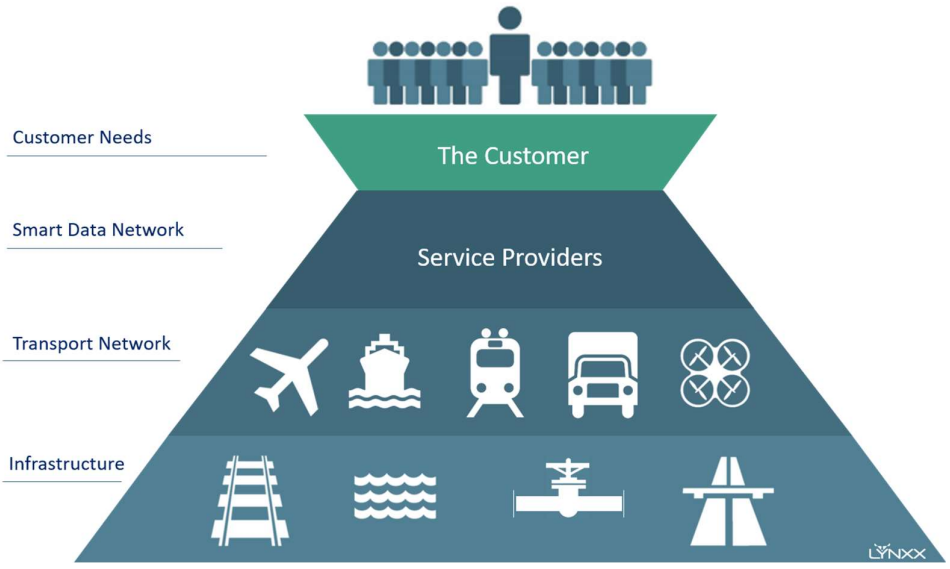

Figure 1 – Logistics Network Pyramid

Freight market developments can be represented in a network model of the transport chain. In this case, the transport network is based on a pyramid (see Figure 1), where the base is comprised of the chain´s physical infrastructure. The infrastructure sits below the transport network, comprised of transport modes used in the chain. With the next layer, service providers connect the supply chain, and finally the needs of the customer are at the top of the pyramid.

The predictability of corridors remains low given the structure and dynamics of this market. Challenges start, or are magnified through the network, when they start at the bottom of the pyramid. Here pressure on infrastructure keeps increasing and where occupancy/efficiency and reliability of the transport network increasingly comes under pressure. For the time being, however there is insufficient pressure on service providers to significantly improve the service and/or utilisation. The role of information asymmetry as a competitive tool, the underlying strategic interests and the lack of confidence in the benefits of the sharing model remain barriers for them.

What Is the Challenge?

Due to the increasing customer demands for deliveries when they expect them, predictability in the transport network is increasingly a differentiator, but not at any cost. Infrastructure and network providers are not unlimited in capacity and a profit motive means that efficiency must be considered (for example, logistics companies cannot run half-empty trucks around just to guarantee predictability). The irony is also that trading predictability with capacity is not a zero-sum game. Increasingly inefficient transport networks will reduce predictability in the medium term as demand for the network exceeds the supply. The sharing of data, to increase predictability and efficiency will therefore play a much more vital role in bringing supply and demand together, albeit in a secure way to avoid anti-competitive activities. Only by sharing data, can service and utilisation levels rise further. It is therefore important for the competitive position of modes, corridors and operators to transition to a digital data sharing environment.

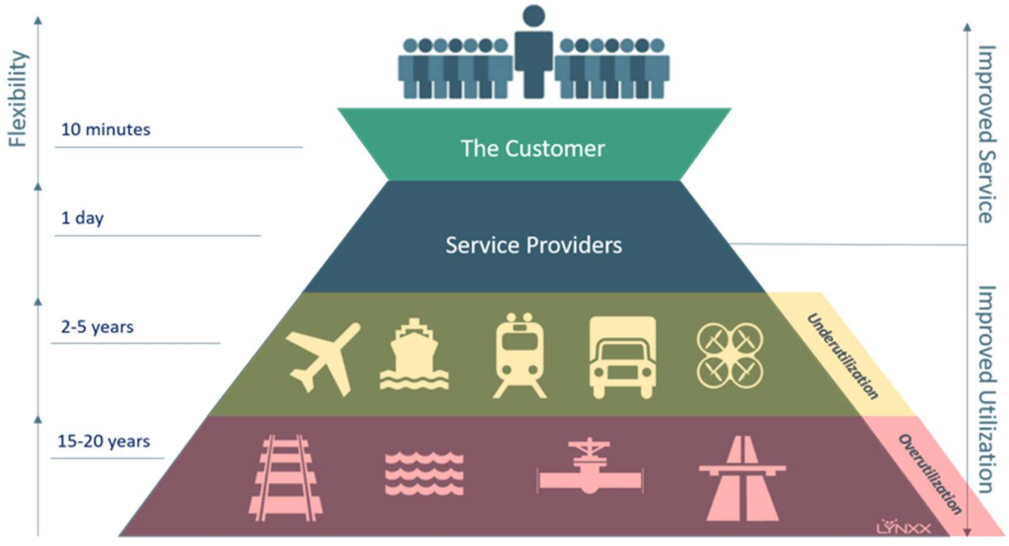

Figure 2 – Pyramid timeframes

Returning to the network pyramid: while the top of the pyramid is focused on providing better service (including predictability and price); the bottom of the pyramid is aimed at increasing utilisation and

efficiency. These two objectives can come together through the action of service providers (or in the case of market failure or absence of incentive, governments).

The transition to the digital corridor from the smart data network by service providers will need to be deployed at some point because service providers will see opportunities to significantly strengthen their own business case by improving the link between the top and bottom of the pyramid.

The question is whether national corridors will have fallen too far behind by that time, losing to other corridors or aggregators, perhaps in the same way that traditional taxis (and regulators) were left behind by ride sharing organisations with more focus on customer need than protecting a traditional business model.

Vision 2030

In 2030, the transport of goods will be highly efficient, predictable and flexible. The existing infrastructure will be optimally used, allowing the existence of sustainable corridors with a high transport reliability. The better utilisation rates in the sector will be due to an increase in transparency in all stages of the logistics cycle. Because data relating to transport, transport conditions, storage and handling are easily accessible in real-time, informed decisions regarding transport between locations are taken. The shipper is in control and determines the transport requirements for a particular consignment. Depending on the requirements, conditions are flexibly arranged within modes (sharing of spare capacity between competitors) and between modes (rail, road, water, air, vacuum, etc.) depending on the requirements of the consignment.

It will have been made possible for all the links in the supply chain to, realistically plan and anticipate real-time deviations through the availability of data. This has greatly increased efficiency and quality-of-delivery. Through increased transparency, strong and weak links in the chain have become clear and an incentive has been created to use and share data. Competitive positions are amended to reflect the parties' abilities to use data for an improved service offering.

In practice, this perhaps means that owner-operators will be on the rise with an uber-type mechanism to optimise pick-up and space usage. Or perhaps there will be a 2030-version of an API providing each carrier's spare capacity to others in the chain with dynamic pricing so that competitors can pick-up for each other when it is in the interests of the whole network. Or perhaps there will be a new breed of independent service provider not competing with any logistics operator but specialising in independent hub to hub transport or multiple-operator intermodal hub management.

Do Governments or Industry Bodies Have a Role in the Transition?

Industry bodies (e.g. trade associations) have a primary facilitating role in which they seek to create an innovative environment to look after their members. We would argue that in the medium-term, this places trade associations firmly in the role of advocating better data sharing and innovative service models for the industry.

In the event that a market fails or policy objectives are not achieved, governments can focus on resolving bottlenecks through policy or incentives. Importantly however, it is becoming much more apparent to customers and governments when a market is failing, or when a network or infrastructure in inefficient. This will increase the expectation that governments set-up, or the potential for a digital disrupter to do so instead.

Given the importance of freight for global and national economic development, the competitiveness of corridors is of great interest. In the current market situation, it is clear that:

- The predictability of transport is lower than it needs to be because of the lack of timely and accurate information sharing (or where it is predictable, we would assert that large and inefficient time buffers exist in scheduling).
- Information asymmetry plays a large role in causing this – but it remains a competitive advantage so unlikely to resolve itself
- The infrastructure provided by the government is never likely to be expanded indefinitely to accommodate inefficient networks

In order to achieve improved corridor competitiveness, and fulfil the goal of becoming a smart logistics network, it is important for governments to take an active role promoting data sharing in logistics planning, in much the same way as governments have started insisting on sharing for the passenger transport industry. Originally this was in reaction to digital disruption, but it could be done proactively for the logistics industry to improve network efficiency and predictability.

Appendix 1: What Guiding Principles Can Governments Follow for Data Sharing Policy-Making?

We would recommend the following guiding principles in relation to government bodies and regulators in order to accelerate the transition to a data-rich logistics network:

1. All measures taken by authorities should be aimed at changing the playing field such that innovation is encouraged by the market itself. Loosely-targeted initiatives do not contribute to the acceleration of the transition but just increase market segmentation.
2. Mutual data-sharing principles must be at the heart of all policy. You get data in return for data. This avoids one-way data monopolies to become established.
3. Infrastructure cannot be indefinitely extended, so it must be managed on the basis of data insights (seeking efficient use of infrastructure and rational decision-making about future investments). This makes data key in infrastructure decision making.
4. Real-time data exchange is necessary in order to become a smart logistics network. Focus must be set on a digital infrastructure that supports this need.
5. Data which reasonably can be made public, is offered even if its application is not yet known. The sooner more data is available, the sooner smart applications can be devised by the market.
6. Data should be made available through APIs (or equivalent) so that data can be shared in an unambiguous, easy and efficient way. Here, governments can retain control over access. If desired, data can be selectively presented and/or for a price.
7. Where possible, users are used to collect data for policy making purposes (source from the lowest possible level)
8. An archive should be maintained on historical data to allow for future predictive analysis and re-use for other purposes.

Appendix 2: What Practical Steps Can Governments Take to Enable Transition to Data Sharing Policies?

Governments can take the following measures aimed at changing the playing field in order to enable the transition to a data-led policy framework:

1. **Introduction of an active (open) data policy comprising:**

- Making data available	- Recognise open data opportunities - Gather necessary data - Offer through APIs
- Promoting the ease of open data	- Increase visibility (through clustering and feedback loops) - Ensure clear definitions and source citations - Keep an archive
- Encouraging the (re)use of open data	- Organise innovation meetings directed towards the creative use and re-use of available data - Actively showcase working examples in the sector
- Engage in stakeholder discussions regarding corridor opportunities and bottlenecks that are evident from a data perspective	- Initiate 'data-oriented thinking' - Act (only) on data-based fact and information

2. **Introduction of data rules, which could include:**

- The use of infrastructure
- The use of data
- Licensing
- Providing concessions to access
- Providing subsidies for paid data
	- Require data delivery from operators (or incentivise it)
	- Reward and penalisation of (un)desired behaviour:
	  o Financial incentives
	  o Information incentives
	- Enforce guidelines