“Enhanced data management techniques for real-time logistics planning and scheduling”

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1. Introduction

LOGISTAR is a Horizon 2020 research project, funded by the European Union (EU). It consists of pan-European partners from academia, the software industry alongside both shippers and forwarders. The key aim of the project is the development of a 'digital tool' to allow:

- Effective planning and optimisation of transport operations in the supply chain;
- Securing horizontal (and vertical) collaboration;
- Real-time decision-making; and
- Real-time visualisation for freight transport.

The main objective of LOGISTAR is as follows:

> *"To allow effective planning and optimizing of transport operations in the supply chain by taking advantage of horizontal collaboration, relying on the increasingly real-time available data gathered from the interconnected environment. For this, a real-time decision making tool and a real-time visualization tool of freight transport will be developed, with the purpose of delivering information and services to the various agents involved in the supply chain, i.e. freight transport operators, their clients, industries and other stakeholders such as warehouse or infrastructure managers."*

Within this main objective are a set of specific ones related to 3 distinct project areas:

PROJECT AREA	SPECIFIC OBJECTIVES
Real-time decision making tool for planning of logistics operations	To *increase by 10% the load factors of freight vehicles* derived from the optimization techniques applied to freight deliveries planning.
	To *shorten by 10% the delivery routes* thanks to applying planning of optimal routes relying on synchromodality, being continuously updated in case of disruption.
	To *increase the reliability and efficiency of logistics services* by predicting events and incidents affecting the supply chain and by providing alternative routes in real-time to these disruptions.
	To *facilitate the management of logistic operations* by providing real-time supply chain visibility through dashboards not only displaying information but also showing deviations, alerts or recommendations to take actions.
	To *boost horizontal collaboration among logistics agents* focusing on full truck load (FTL) backhaul opportunities, consolidation of less than truckload (LTL) deliveries, supply chain collaboration and synchromodal opportunities.
Real-time information on synchromodal transport	To *increase the visibility of the delivery* derived from the use of sensors to monitor the goods shipped and boosting to share logistic data&information among agents.
Rest of the Implementation of the project	To *promote the sharing of open data in the logistics sector* by promoting the benefits of collaboration and Big Data analytics across stakeholders.
	To *enable new market opportunities* on the logistic information services sector, by developing new business models focused on data and high value service delivery, and exploring concepts such as "sharing" rather than "owning" transport assets. The policy and legal dimension will also be studied.

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This Deliverable 1.5 reports on the following issues:

- A summary of relevant EU policy, focusing on general transport policy and relevant policy on technology. It sets out the policy environment within which the project is being developed; and
- European Union competition law which provides the legal context for LOGISTAR where the tool will involve enabling horizontal and vertical collaboration and the General Data Protection Regulation (GDPR) as it relates to the project.

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2. Policy Review

2.1. Introduction

This section of the report provides a summary of relevant EU policy, focusing on general transport policy and relevant policy on technology. It therefore sets out the policy environment within which the project is being developed and examines the extent to which there is a good 'policy fit' between the key policy objectives of the EU and the objectives of the LOGISTAR project.

2.2. Transport Policy

The future of transport in the EU is largely shaped by a white paper entitled **Roadmap to a Single European Transport Area (2011)**.

The link between transport and the economy is firmly engrained in the white paper, with mobility of goods and citizens seen as paramount to Europe's future success. The white paper highlights the existence of bottlenecks and the detrimental effect they have on transport flows. Heavily linked to bottlenecks is the occurrence of congestion, cited as a major concern, particularly on the road network. LOGISTAR has the objective of addressing the issue of congestion by reducing the number of freight transport vehicles on the road by increasing load factors and making better use of real-time information to inform route planning.

Paragraph 8 of the white paper cites the importance of new technologies for vehicles and traffic management. The push towards sustainable mobility is linked to seeking to reduce emissions. A major aim for supporting mobility is to facilitate its growth while reaching an emission reduction target of 60% of Green House Gases (GHGs) by 2050 with respect to 1990 levels. One of the main ways the white paper sees this being achieved is through a lower dependence on oil, through the greater use of electric vehicles and the use of walking and cycling for people. This is not something that is directly addressed through LOGISTAR which is effectively mode neutral, although if load factors for freight can be increased by 10% and delivery routes shortened by 10% through the use of the digital tool then this will ultimately have a positive contribution in helping to reducing emissions.

The white paper recognises the need to meet demand for freight transport and is against curbing mobility of both goods and passengers throughout Europe. It states that new transport patterns must emerge, *"according to which larger volumes of freight and greater number of travellers are carried jointly to their final destination by the most efficient (combination of) modes. Individual transport is preferably used for the final miles of the journey..."* LOGISTAR recognises the need to boost horizontal collaboration within road haulage to increase load factors and therefore reduce the number of freight movements, through sharing data and information.

The white paper explains that the use of information technology for simpler and more reliable transfers (of goods and passengers) can facilitate the emergence of these transport patterns. Further, the optimisation of multimodal logistic chains is cited as a way of achieving this.

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Under the headline of "*an efficient core network for multimodal intercity travel and transport*", the white paper highlights the fact that freight shipments over short and medium distances (below 300km) are mainly by truck, citing the importance of modal shift and improving efficiency. This can be achieved via the development and take-up of new engines, cleaner fuels and the use of intelligent transport systems. The scope for decarbonisation is seen as more limited for longer distance freight movements.

To secure a shift towards clean urban transport, the white paper states that the interface between long distance and last-mile freight transport should be organised more effectively. Although LOGISTAR is mainly concerned with road transportation and synchromodality, the aim of limiting individual deliveries is something that could be tackled through LOGISTAR by boosting horizontal collaboration among logistics agents focusing on full truck load (FTL) and consolidation of deliveries. Again, the white paper suggests that this could be achieved by the use of electric vehicles and hybrid technology to reduce emissions. However, a reduction in emissions would occur through greater collaboration as a result of the development of the LOGISTAR tool as fewer deliveries would be required.

In implementing the goals of the white paper, the EU states that innovation is essential for the strategy. The research needs to *"address the full cycle of research, innovation and deployment in an integrated way through focusing on the most promising technologies and bringing together all actors involved."*

This is referenced further under the heading of "innovating for the future – technology and behaviour". The white paper states that technological innovation can achieve a faster transition to a more efficient and sustainable European transport system through three main factors:

- Vehicles' efficiency through new engines, materials and design;
- Cleaner energy use through new fuels and propulsion systems;
- Better use of network and safer and more secure operations through information and communication systems.

The third point is at the heart of the LOGISTAR project, which will focus on real-time decision making and information to better inform logistics operations. The need for innovation and deployment to be supported by an appropriate regulatory framework is also covered in the white paper. Further, protection of privacy and personal data is cited as being needed to be developed in parallel with the wider use of information technology tools going forward. The need to study the legal dimension and implications of LOGISTAR is recognised and will be covered within the third project area.

New mobility concepts, for both passengers and freight, should be explored, with the white paper suggesting that more sustainable behaviour and better mobility planning should be actively encouraged: "*Information on all modes of transport (for freight), on possibilities for their combined use and on their environmental impact would need to be widely available*".

The white paper goes on to state that for freight better electronic route planning across modes and real-time delivery information is needed. It envisages ICT as having the potential for satisfying accessibility needs going forward. This relates to a specific objective of LOGISTAR,

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which aims to shorten delivery routes by 10% by planning optimal routes and continuously updating them in case of disruption using shared real-time information.

The white paper suggests incorporating land-use planning, pricing schemes, efficient public transport services and infrastructure for non-motorised modes and charging/refuelling of clean vehicles. This would be achieved primarily within a national context and member states would likely aspire to this within their own policies. The white paper then goes on to discuss the core network corridors and TEN-T infrastructure. Information technology is again referenced within this as a tool to be deployed "*to simplify administrative procedures, provide cargo tracking and tracing, and optimise schedules and traffic flows (e-freight*)".

In Annex 1 of the white paper, e-freight is explored further in *initiative 7: Multimodal transport of goods: e-Freight.* It supports the creation of an appropriate framework to allow tracing goods in real-time, ensuring intermodal and clean transport movements. The concept of a 'single window' and a 'one-stop administrative shop' is discussed; by creating and deploying a single transport document in electronic form and promoting track and trace technologies.

European strategy on transport and the environment European Environment Agency, 2007

This strategy defines objectives for integrating environmental requirements into transport policy, providing guidelines for a range of measures in various sectors. The aim is to ensure that environmental questions are taken into account when drawing up and implementing transport policy. Infrastructure charging and the cost of vehicles that produce more Greenhouse Gas (GHG) emissions are discussed as ways of reducing the environmental impact of road transport, including noise pollution as well as environmental emissions.

In relation to LOGISTAR, this strategy is not directly relevant, with environmental impacts of road freight vehicles tackled through collaboration between providers and making better use of vehicle utilisation, to ultimately reduce the number of vehicles that are required on the road.

Europe on the move: Sustainable mobility for Europe (COM/2018/293)

This communication is focused on safety of the roads within the EU, noting that in comparison to the rest of the world they are relatively safe but recognises there is room for improvement. The Commission's second legislative proposal aims to improve road infrastructure safety management to reduce the number of accidents and their severity. The communication raises the issue of future advanced vehicle technology and how it will have to rely on the current physical infrastructure.

The document includes a proposal to establish a digital environment for information exchange in transport. This proposal is aimed at establishing a fully digital and harmonised environment for information exchange between transport operators and authorities. The proposed regulations cover electronic freight transport information which will allow simplified exchanges between businesses and authorities along transport routes from the point of entry in the ports of the EU to the goods' final destination.

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It is envisaged that this will cut 'red tape' and facilitate digital information flows for logistics operations. Although LOGISTAR mainly promotes an exchange between companies and logistics operators as opposed to local authorities, the idea of collaboration is promoted as a means of improving logistics operations. The document also cites how this can lead to better connectivity between different transport modes, improving multimodal solutions.

2.3. Digital policy

The European Commission's document **Digital agenda for Europe (2014)** sets out the digital and technological priorities of the EU.

One of the major challenges facing the EU with regards to the digital economy is that it is growing at seven times the rate of the rest of the economy. The digital agenda for Europe is aimed at *'boosting Europe's economy by delivering sustainable economic and social benefits from a digital single market'.*

The commission will look to support the deployment of a high-quality, digital network infrastructure, and activities that turn digital research into successful European innovation stories. This digital agenda is one of the seven pillars within the Commission's Europe 2020 strategy.

Digital Single Market Strategy (2015), European Commission

As referenced above, within the European Commission's strategy is the concept of a digital single market (DSM). The DSM is described as allowing free movement of persons, services and capital allowing individuals and businesses to seamlessly access and engage in online activities in a fair competition environment. The DSM is one of the commission's political priorities and the DSM Strategy was adopted in May 2015, with the following pillars:

1. Access: better access for consumers and businesses to digital goods and services across Europe;
2. Environment: creating the right conditions and a level playing field for digital networks and innovative services to flourish;
3. Economy & Society: maximising the growth potential of the digital economy.

The European Commission aspires to moving further towards an inclusive digital society to create smarter cities, improved digital skills for citizens and improving access to services. The DSM strategy also encourages extracting the maximum growth potential of the digital economy and it references digitisation as offering "unprecedented opportunities to other economic sectors, such as transport (e.g. intelligent transport systems)".

The strategy states that the EU will need a range of measures to ensure that European industries are at the forefront of developing and exploiting ICT to serve markets in the future, noting that any innovations associated with this should improve inclusivity and that benefits from digital services (e-transport) should be available seamlessly across the EU.

The building of a data economy is another part of the DSM. The strategy considers data as a catalyst for economic growth, innovation and digitisation across all economic sectors. A

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fragmented market is seen as being a barrier to providing sufficient scale for cloud computing. A lack of interoperable systems and data portability between services represents a barrier for the cross-border flow of data and the development of new services. The strategy references the implementation of multi-modal travel information systems as something that could be hindered by this.

The theme of interoperability - effective communication between digital components like devices, networks or data repositories and better-connected supply chains – is discussed. The adoption of standardisation within the context of interoperability is seen as helping to steer the development of new technologies and data driven services such as e-transport. The strategy recognises that the EU needs to define missing technological standards that are seen as being essential for supporting the digitisation of service sectors.

LOGISTAR aims to enable new market opportunities within the logistics information services sector, by developing new models that focus on data and high value delivery. It will fit within the development of data-driven services and promote the concept of e-transport for freight and logistics.

The deployment of intelligent transport systems (ITSs) in Europe (Directive 2010/40/EU)

ITS are expected to contribute to creating a cleaner, safer and more efficient transport system across the EU. The directive seeks to encourage the development of innovative transport technologies with the introduction of common EU standards and specifications. This directive follows a previous one on Intelligent Transport Systems produced in 2008.

ITS are defined as *"systems in which information and communication technologies are applied in the field of road transport, including infrastructure, vehicles and users, and in traffic management and mobility management."*

Primarily the application of ITS will focus on EU road transport and how different ITSs communicate with other modes of transport. The directive calls for the optimal use of road, traffic and travel data, continuity of traffic and freight management ITS services and linking vehicles with the transport infrastructure, i.e. equipping vehicles to allow for exchange of data or information.

Within the priority areas, there are 6 priority actions which focus on:

1. EU- wide multimodal travel information services (for journeys involving different transport modes, e.g. train and ship);
2. EU—wide real-time traffic information services;
3. How to provide road safety-related traffic information free of charge to users;
4. The harmonised availability of an interoperable EU-wide eCall service;
5. Information services for safe and secure parking places for trucks and commercial vehicles;
6. Reservation services for safe and secure parking places for trucks and commercial vehicles.

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EU countries are required to ensure that the related specifications adopted by the Commission are applied. Individual EU countries keep the right to decide on the deployment of these applications and services in their own territory.

Many of the priority areas listed are covered within the LOGISTAR project, with ITS and the use of real-time information to inform freight vehicle movements paramount to its success.

European e-freight capabilities for co-modal transport (2013), European Commission

The vision of the e-freight project was to rely on co-modality and advanced technology to provide a competitive European surface freight transport system whilst promoting environmental sustainability. The project explored the potential for a paperless freight transport process where an electronic flow of information is linked to the physical flow of the goods. It was expected that this would lead to a future of "*intelligent cargo*", meaning that goods would be location-aware and connected to a range of information services allowing automation of transport management processes.

The e-freight project was designed to inform other transport policy, specifically those concerned with ITS and freight transport. It developed from the Freight Transport Logistics Action Plan (2007) which encouraged 'work towards a standard for information flows to ensure the integration and interoperability of modes at data level and provide open, robust data architecture primarily for business-to-business administration (B2A) flows". Other areas it wanted to explore included work on a standard data set to describe freight, including for regulatory requirements and the establishment of a Single Window (single access point) and one stop-administrative shopping for administrative procedures in all modes.

The concept of the single window was introduced by the United Nations Centre for Trade facilitation and Electronic Business (UN/CEFACT) with the aim of enhancing the efficient exchange of information between trade and government. In the EU context, single windows have been developing for many years across two main areas; trade facilitation (e-Customs) and for transport (monitoring vehicle and cargo movements). Both of these single window concepts rely on businesses, port authorities and customs authorities reporting into the single window concept, with inputs from national authorities dependent on modes used.

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3. EU Competition Law

3.1. Introduction

LOGISTAR is a project that aims to develop a digital tool to streamline the practices of organising transport in the supply chain for maximum efficiency. To do this the idea is to improve the speed of planning transport legs in the supply chain, by enabling rapid and real-time operational decision-making, and facilitate cooperation between cargo owners (shippers) (horizontal collaboration) and between shippers and their logistics providers (LSPs) (vertical collaboration).

These aims, while laudable, may lead participants inadvertently to run the risk of infringing EU competition law. This paper seeks to explore the many and varied issues involved. The section is structured as follows:

- Description of the relationships involved between companies involved in the logistics of a supply chain
- Overview of EU Competition Law
- Competition law as it potentially applies to logistics partners
- Mitigation of risks
- Summary and conclusions.

3.2. Description of the relationships involved between companies involved in the logistics of a supply chain

The themes of the LOGISTAR research project in seeking to secure greater efficiency in supply chains necessitate an examination of the way in which companies interact through functional and operational relationships as well as legal and contractual. Since this paper is discussing the matter of competition law with respect to the desired outcomes for the development of the digital tool it is first useful to summarise the potential interactions between businesses in the logistics supply chain.

Deliverable 8.3 (LOGISTAR_D8.3_New_Emerging_Business_Model_Report_Release1_v1.0 , *November 2018*) describes current principal logistics supply chain models with respect to retailers and manufacturers (shippers) and their transport operators in detail. The diagrams presented in Annex 1 show the flows of goods between the main components of the supply chain; the information flows will be more complex in terms of the way in which information is transmitted and received, the detailed content of the information where some will be commercially sensitive and omitted from levels of documents and information will also be generated along the supply chain and detail will also change. In this report, we only concern ourselves with the implications of collaboration with respect to competition matters.

There are important differences in supply chain models that reflect the business models of the constituent companies. The design of the digital tool will need to be able to accommodate the full range of potential operational functions. Further, it is common practice now for retailers and manufacturers to out-source their transport and other logistics functions to specialist third

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party logistics operators or '3PLs'. In effect, through these operators, a certain level of efficiency is gained as the 3PL will seek to optimise the use of its own equipment and infrastructure, for example by storing several customers' products in one warehouse location and similarly, where appropriate, using their own network to perform load-sharing and multi-drop operations for different retailers or manufacturers. The ability to drive economies through scale in turn benefits the cargo owners as in theory they share in the benefit of reduced costs. It might be argued that the LOGISTAR tool would be most useful to existing logistics operators, or conversely that it could enable larger shippers, where their logistics operations are complementary, to collaborate and thereby dispense with the services of 3PLs altogether, subject of course to competition law.

The key commercial players in supply chains are several of the following in different combinations depending on the companies' business models:

- Retailer – could be traditional high-street, on-line or a combination of the two; or E-commerce (no physical shops)
- Supplier to the retailer or manufacturer
- Transport operator (carrier): road haulier, rail freight operator, shipping company, airfreight operator
- Transport terminal operator (intermodal terminal or rail freight terminal operator, possibly port operator)
- Freight forwarder (mostly in the case of international movements)
- Contracted 3PL or 4PL
- Operator of warehouse/RDC/cross-dock facility if different from terminal operator or retailer/manufacturer/3PL/4PL.

The above list reflects vertical rather than horizontal relationships in that it does not show collaboration between suppliers, or retailers, and so on. Yet it is the horizontal collaboration in particular that is believed to offer the greatest potential for increasing efficiencies in the supply chain through the use of digital tools such as LOGISTAR; there are therefore, in theory, layers of shippers that could cooperate to fill transportation units.

The next section outlines competition law and therefore the legal context for LOGISTAR where the tool involves enabling horizontal and vertical collaboration.

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3.3. Overview of EU Competition Law

Competition law seeks to maintain fair market competition, that is, enable private firms to operate in a context where, by varying aspects of their offer, product price, promotion, and so on, they can increase their market share and profitability without restriction by other trading entities of whatever nature. The law aims to regulate behaviour which is 'anti-competitive'.

There are three principal themes within competition law:

- Preventing restriction of free trade by prohibiting practices or agreements that restrict free trading between companies and competition between businesses, particularly the establishment of cartels[1].
- Prohibiting market abuse by dominant or anti-competitive behaviour such as predatory pricing, refusal to trade, excessive prices etc.
- Supervision of mergers and acquisitions of large corporations, which can lead to prevention by the competition authorities of the transaction, or requirement to divest of certain activities, and so on.

Competition law can be considered at the level of individual countries, that is, the nation state has a regulatory authority that maintains fair competition within the national boundary, and at international level where international competition agreements seek to protect international competition. The principal regulator in the latter respect is the World Trade Organisation[2], apart from matters pertaining to trade between European Union Member States, where the European Union is the first regulator.

European competition law maintains competition within the European Single Market. It regulates companies' behaviour to prevent anti-competitive practices such as creating cartels and monopolies. Most of the law is enshrined in the Treaty on the Functioning of the European Union (TFEU), Articles 101 to 109, together with relevant Regulations and Directives. Added to the three general themes of competition law set out above is a fourth: control of direct and indirect (State Aid) given by EU Member States to businesses in their country. Primary control rests with the European Commission and its Directorate General for Competition, although State Aid in particular sectors is also handled by other Directorates (including DG MOVE for the transport sector).

While the European Commission has a wide range of inspection and enforcement powers that allows it to investigate individual businesses, hold hearings and also grant exemptions from the law, since 2004 and Regulation 1/2003 (the 'modernisation' process) some of its enforcement functions have been undertaken by national competition authorities (NCA) in

[1] A cartel is a group of otherwise independent businesses that uses price fixing or other restrictive practices to increase their collective profits.

[2] The World Trade Organisation (WTO) is an intergovernmental organisation that deals with the regulation of trade in goods, services and intellectual property between countries signed up to its agreements.

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Member States. The Regulation allows national competition authorities and national courts to apply and enforce Articles 101 and 102 of the TFEU.

However, where the effects of anticompetitive behaviour have an effect on trade between EU countries, in the context of the internal market and globalisation, the Commission will pursue trans-EU cases. The NCAs and the European Commission exchange information on implementing EU competition rules through the European Competition Network (ECN)[3].

The Commission is able to investigate potential violations (i.e. the possibility of future anti-competitive behaviour) so it can act before any rules are broken in order to safeguard a competitive market; therefore it tries to prevent anti-competitive behaviour as well as punish it when it happens.

Article 101 (TFEU)[4]

Article 101(1) prohibits any agreement or collective behaviour whether formal or informal, written or unwritten between any two independent businesses that might affect trade between EU Member States and that has the effect, or object, of preventing or restricting competition. This covers secret price-fixing or market sharing cartels and other agreement such as exclusivity in geographic areas or territorial restrictions. That is not to say all such agreements would be regarded as anti-competitive, as some may fall outside the prohibition or meet the exemption criteria set out in Article 101(3)[5].

Article 102 (TFEU)[6]

Article 102 prohibits the abuse of market power by dominant companies where it affects or may affect trade between EU Member States. Key to this is the definition of the market in each relevant case which may be defined quite narrowly.

Merger Control Regulation[7]

The EU Merger Control Regulation allows the Commission to control certain mergers, acquisitions and joint ventures involving companies operating in Europe where they would significantly reduce competition in the Single Market. Companies meeting a set of criteria (set out below) complete a detailed questionnaire notifying their 'deal' to the Commission.

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[3] The European Competition Network (ECN) is a forum for discussion and cooperation between the European Commission and EU Member States national competition authorities (NCAs). Its objective is to provide an effective legal framework to enforce EC competition law against companies that engage in cross-border business practices which restrict competition. Within the ECN the sector (e.g. pharma, food, banking etc.) experts discuss competition problems and propose a common approach enabling the Commission and NCAs to share experience and identify best practices.

[4] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:12008E101:EN:HTML

[5] The four conditions are that the agreement: (a) contributes to improving the production or distribution of goods or to promoting technical or economic progress; (b) allows consumes a fair share of the resulting benefit; (c) does not impose restrictions that are not indispensable to the attainment of conditions (a) and (b); and (d) does not afford the possibility of eliminating competition in respect of a substantial part of the products in question.

[6] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:12008E102:EN:HTML

[7] Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings (the EU Merger Regulation)

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Criteria for merger examination are based on the merging firms reaching certain turnover thresholds in one of two ways:

The first alternative requires:

- A combined worldwide turnover of all the merging firms over €5 000 million, and
- An EU-wide turnover for each of at least two of the firms over €250 million.

The second alternative requires:

- A worldwide turnover of all the merging firms over €2 500 million, and
- A combined turnover of all the merging firms over € 100 million in each of at least three Member States,
- A turnover of over €25 million for each of at least two of the firms in each of the three Member States included under ii, and
- EU-wide turnover of each of at least two firms of more than €100 million.

In both alternatives, an EU dimension is not met if each of the firms achieves more than two thirds of its EU-wide turnover within one and the same Member State. About 300 mergers are typically notified to the Commission each year.

Smaller mergers which do not have an EU dimension may fall instead under the remit of Member States' competition authorities. There is a referral mechanism in place which allows the Member States and the Commission to transfer the case between themselves, both at the request of the companies involved and of the Member States. This allows the companies to benefit from a one-stop-shop review and to allocate the case to the most appropriate authority.

The Commission must be notified of any merger with an EU dimension prior to its implementation. If the merging firms are not operating in the same or related markets, or if they have only very small market shares not reaching specified market share thresholds, the merger will typically not give rise to significant competition problems: the merger review is therefore completed by means of a simplified procedure, involving a routine check. The market share thresholds are: 15% combined market shares in any market where they both compete, or 25% market shares in vertically related markets. A 'market' can be defined in relatively narrow business areas, both in terms of products and geographic areas. Above those market share thresholds, the Commission carries out a full investigation.

Enforcement of the EU competition rules

The principal enforcement agency is the European Commission through its Directorate General for Competition. However, NCAs and Member States domestic courts can apply the Article 101(1) prohibition on anti-competitive agreements and declare whether the criteria of Article 101(3) (exemption from Article 101) are met by any particular agreement. Businesses are encouraged to ‘self-assess’ as to whether their actions and agreements are not infringing Articles 101 and 102. Where disputes on the application of these articles arise national courts are able to rule on the case subject to judgement oversight by DG Competition.

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Since NCAs are obliged to apply EU competition rules the greater number of Article 101 and 102 cases are now handled at the NCA level though Member States are at liberty to apply their own competition rules in addition, where they are not in conflict with EU rules.

While EU competition rules apply to businesses (officially defined as 'undertakings') so that employees engaged in anti-competitive practices will not be individually liable to action under these rules, criminal or other proceedings could be brought in some Member States depending on their own rules. Companies are likely to be held liable for the improper action of their employees who will in turn also be subject to disciplinary action if they put their company in breach of competition law by breaching the companies' competition law compliance policies.

Cartels

Cartel behaviour, that is any secret agreement or understanding between competitors that fixes prices, limits output, shares markets, customers or suppliers, is generally viewed as a most serious infringement of competition law. While some agreements caught by Article 101(1) are exempted by fulfilling the criteria of 101(3) in that "the efficiencies flowing from the agreement outweigh the anti-competitive effects, with a fair share of those benefits flowing to consumers", it is extremely unlikely that a cartel agreement would satisfy those criteria.

Commercial cooperation

An agreement will only be caught by Article 101(1) if it affects trade between Member States and restricts or distorts competition to a significant degree, which is not always easy to define. In order to determine whether a commercial agreement falls foul of Article 101(1) it is necessary to identify the affected markets in all respects, that is products and geography. The Commission provides guidance on how it would arrive at a market definition[8] for competition law purposes, noting that every individual case is examined on its own merits and consulting with the parties, customers and competitors. There is also a guidance notice – the *De Minimis* notice[9], which proceeds on the basis that agreements between actual or potential competitors are more likely to pose a threat to competition than agreements between non-competitors. Therefore the Commission allows agreements between large companies that are non-competitors if the parties have a combined market share of no more than 15%, of course, assuming that the agreement does not have the object of preventing, distorting or restricting competition within the internal market. Where competitors are entering into an agreement the threshold is 10% with the same proviso with respect to not having the object of preventing, distorting or restricting competition. For SMEs (small and medium-sized enterprises with fewer than 250 employees and annual turnover not exceeding 50m euros or assets not exceeding 43m euros) are not usually capable of affecting trade between Member States and will not normally merit investigation.

Assessment of the scale of impact of any agreements has to take into account whether any trade flows between Member States are appreciably affected and, if not, then any competition

[8] The Commission's Market Definition notice (OJ 1997 C372/3, 9.12.1997)
[9] De Minimis Notice (OJ 2014 C291/1, 30.8.2014)

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issues should be a matter for the relevant NCA; and which markets may be affected together with the parties' strengths in those markets. An agreement will not be relevant within Article 101(1) if the weak market position of the parties means that there is no appreciable effect on market behaviour or on the opportunities available to third parties (customers, competitors and suppliers).

There are various types of cooperation that occur between businesses.

3.3.1. Horizontal cooperation

Where companies, operating at the same level of production or distribution in a market, form any kind of agreement it is defined as horizontal cooperation. The nature of the agreement may incorporate various facets of business but are usually designed to make the companies more profitable, whether it is by risk sharing, and or cost saving and so on. Such commercial agreements may bring benefits to consumers in the form of more technically sophisticated products and greater choice. They may also help to open up national markets and lead to the sharing of know-how across Europe.

The Commission has produced Horizontal Guidelines[10] which recognise that the effects of cooperation are not anti-competitive if the companies involved do not have market power provided that the object of the cooperation is not aimed at price fixing or other actions that are anti-competitive.

The 'hardcore' restrictions that automatically mean an agreement is caught by Article 101 involve any of the following restrictions between competitors that have the object of:

- Fixing of prices when selling products to third parties
- Limitation of output/sales
- Allocation of markets/customers
- Rigging of bids
- Exclusion of an actual or potential competitor through a collective boycott
- Sharing of individualised information regarding intended future prices or quantities
- Restriction of parties' ability to carry out R&D activities or to continue to use their technology for further R&D.

For agreements between non-competitors, restrictions having the following as their object are also regarded as 'hardcore' and prohibited:

- Price-fixing or resale price maintenance
- Certain territorial/customer sales restrictions
- Further territorial/customer sales restrictions in selective distribution systems
- Certain sales restrictions involving spare parts.

The Horizontal Guidelines focus on six broad categories of cooperation:

[10] Guidelines on the applicability of Article 101 to horizontal cooperation agreements (OJ 2001,C11, 1.01.2011)

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(i) Information exchange

(ii) R&D agreements

(iii) Production agreements

(iv) Purchasing agreements

(v) Commercialisation agreements

(vi) Standardisation agreements and standard terms.

The Horizontal Guidelines, in recognition that certain types of horizontal agreements are unlikely to have a negative effect on competition provided they are between parties which do not enjoy market power, effectively raise the *de minimus* market share thresholds to 25% for R&D agreements, 20% for production agreements and 15% for purchasing agreements and commercialisation agreements.

(i) Information exchange

Exchange of information between businesses can take a number of different forms, such as sharing data directly between competitors or indirectly through a common agency or a third party. Such exchange can have positive effects in competitive markets but it can also reduce competition.

Information exchange is only subject to review under Article 101(1) if it establishes or is part of an agreement, a concerted practice or a decision by a group of undertakings. A 'concerted practice' means a loose or informal type of arrangement between parties that is aimed at limiting competition. Information exchange can constitute a concerted practice if it reduces strategic uncertainty in the market thereby facilitating collusion. It usually arises between competitors but can arise with only one of the parties disclosing information to the other.

Evaluation of whether such information exchange is anti-competitive will take into account the economic context. Whether information exchange will have a restrictive impact on competition depends on both the nature of the information which is exchanged and the characteristics of the market. The Commission is also interested in how the information exchange might change market conditions. The following list from the Horizontal Guidelines describes the information exchanges which are more likely to have anti-competitive effects:

- Strategic information: data related to prices which reduces strategic uncertainty in the market such as actual prices, discounts, increases, reductions, rebates, customer lists, production costs, quantities, turnover, sales, capacities, qualities, marketing plans, risks, investments, technologies, and R&D programmes;
- Market coverage by the parties has to be sufficiently large;
- Extent to which data is aggregated; more individualised data is likely to lead to restrictive efforts;
- Age of data; historic data is less likely to give an indication of the competitor's future plans;

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- Frequency of information exchange; if information is exchanged infrequently this is less likely to lead to collusion between the competitors;
- Non-public information is more likely to reduce strategic uncertainty; there is no issue with public domain information being passed on.

Some information exchanges can lead to market efficiency gains. Information about a competitor's costs can enable companies to become more efficient if they benchmark their performance against industry best practice but there is a limit to how much the exchange of information will ultimately benefit the consumer.

The key issue for LOGISTAR is that the system or software is likely to support horizontal co-operation through the exchange of company specific and confidential information on traffic flows between specific origins and destinations on at least a daily basis and using near real-time data. This exchange of data would relate to either sales volumes to individual customers or procurement volumes from individual suppliers and may also need to include generic transport cost information. However, it would lead to public benefits in terms of lower environmental externalities and lower costs for the companies (i.e. efficiencies) which should be passed on to customers in the medium to long term through competitive market forces.

In two previous European projects - www.co3-project.eu and www.nextrust-project.eu - the novel concept of a "neutral trustee" was introduced and tested. A neutral trustee is a 3rd party "black box" that collects and combines data from potential competitors in the supply chain in order to maximize horizontal logistics synergies, while respecting commercial confidentiality. The LOGISTAR system may be seen as the technical operating system of such a neutral trustee.

(ii) R&D agreements

Research and development, particularly for technology based products, is an essential part of business strategy and is often undertaken in collaboration with other companies, either in whole or in part. The Commission looks favourably at collaboration which is only for R&D purposes but is more wary of cooperation in exploitation of the outcomes of R&D carried out in collaboration.

R&D agreements often include restrictions on the parties' independent activities in the area covered by their collaboration particularly when the agreement extends to manufacturing and marketing. EU competition law accepts that some contractual limitations on the parties are necessary to encourage effective joint R&D but restrictions can lead to competition concerns if the parties are large and have significant market power compared to non-competitors.

Assessing whether R&D collaboration has the potential or intention of restricting competition requires consideration of the parties, the aims of the collaboration and the relevant market. Assuming the parties are independent and that the R&D agreement will not have an appreciable effect on EU trade then the critical assessment depends on the relevant market definition.

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The facts that need to be considered in relation to the products, technologies or R&D efforts planned or undertaken include the impact on the product market directly concerned by the cooperation. That is, will the new resulting product compete in an existing product market and if it does, do the parties together have a strong market position and is there little other innovation in the market; or will it be an entirely new product market and similarly have a negative impact by replacing existing products that address similar needs. The impact of the collaboration on innovation in the relevant market will need to be assessed if the parties have a strong market position together.

The Commission would also want to consider any closely related neighbouring product market should the competitors be significant parties with market power in downstream activities.

Similarly for technology markets, there is existing and new to be considered. The license income from IPR generated by the parties would be used to calculate market shares for an existing technology market. For entirely new technology markets the emphasis would be on potential competition and whether sufficient potential entrants to the relevant market can be identified, over a three year time frame, as this would constrain price rises and therefore the collaboration would not be restricting future competition.

R&D cooperation can also significantly affect competition in innovation. The Commission's competition analysis would consider whether there are sufficient other parties remaining outside the R&D agreement to provide competition for new products in the relevant market.

The Commission accepts that 'pure' R&D agreements which do not restrict the parties' independent R&D activities and exploitation are unlikely to restrict competition. The Horizontal Guidelines also recognise that Article 101(1) would also not apply in the case of a company outsources its R&D to a specialist company, research institute or academic body which is not active in the exploitation of results.

In the knowledge that R&D cooperation, then, is primarily pro-competitive, the Commission has adopted a block exemption regulation under Article 101(3) in respect of R&D agreements.[11] This block exemption will apply to an R&D agreement containing provisions which relate to the assignment or licensing of IPRs to one or more of the parties or to an entity that is established jointly for the purposes of research and development, any paid-for research and development or joint exploitation, provided that these provisions are necessary for the implementation of the agreement and not its primary object.

The R&D block exemption sets out various categories of restrictions which are considered likely to be caught by Article 101(1) as they are obviously restrictive to competition and therefore unlikely to be covered by the exemption criteria in Article 101(3). These are:

- Non-compete restrictions on R&D prohibiting independent R&D or agreements with third parties

[11] Commission Regulation (EU) 1217/2010 (OJ 2010 L335/36, 18.12.2010)

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- Quantitative restrictions on the number of contract products a party may manufacture or sell or operations it may carry out during the contract process
- Pricing restrictions on freedom to determine prices when selling contract products to third parties
- Restrictions on passive sales of contract products (or licensing of contract technology) in any territories or to any customers in the EEA which have not been exclusively allocated to one of the parties by way of specialisation in context of exploitation
- Restrictions on licensing of third parties to manufacture or apply the contract processes in circumstances where the agreement does not envisage joint exploitation or the parties do not themselves exploit the results of the joint R&D
- Restrictions or concerted practices impeding parallel trade involving
  - Refusals to meet orders from users/dealers in the parties' respective territories who would market the contract products in other parts of the EEA
  - Making it difficult for users/dealers to obtain contract products from other dealers within the EEA.

Where an R&D agreement does not contain any of the above restrictions it is eligible for Article 101(3) exemption through the 'safe harbour' of the R&D block exemption provided that it meets the block exemptions other conditions. The block exemption expressly provides that 'no challenge' clauses and licensing restrictions which prevent exploitation of the R&D are excluded from the scope of the block exemption.

If any of the businesses participating to the R&D agreement are not actual or potential producers of products capable of being improved or replaced by the contract products they can benefit from the block exemption irrespective of their market share but if they are actual or realistic potential competitors they can only benefit from the block exemption if the participating businesses' combined market share did not exceed 25% of the relevant market for the products capable of being improved or replaced by the contract products, at the time of signing the agreement. If this threshold is not crossed the parties can benefit from the block exemption for the duration of the joint R&D stage. However, if the R&D agreement extends to joint exploitation, the parties can rely on the R&D block exemption for seven years from the date the contract products are first put on sale in the EU.

While this form of cooperation is relevant to the LOGISTAR project itself, it is probably less relevant for any system or software that emerges from the project.

(iii) Production agreements

A production agreement relates to the conditions under which two or more parties will cooperate in the production of goods or the provision of services. The parties may be competitors or not but the object is to gain efficiency through rationalisation. The Horizontal Guidelines define production agreements as follows:

- Joint production agreements: where the products are produced jointly (whether as a joint venture or not)

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- Horizontal subcontracting agreements: where parties operating in the same product or services market, irrespective of whether they are competitors or not, agree to any of the following:
  - Unilateral specialisation agreements; an agreement between two parties active in the same product market, where one party ceases to produce the product and agrees to purchase from the other party[12]
  - Reciprocal specialisation agreements: where two or more parties in the same product or services market agree on a reciprocal basis to cease production, fully or partly, and to source the products from the others[13]
  - Subcontracting agreements: where the contractor entrusts the subcontractor with the production of a product, while the contractor does not at the same time cease or limit is own production of the product, thereby expanding overall production.

Subject to certain conditions joint production agreements as well as unilateral and reciprocal specialisation agreements may benefit from the specialisation block exemption[14].

Considering production agreements under the competition rules requires an assessment of the markets directly concerned by the cooperation and any upstream markets for inputs, downstream markets for final products or other neighbouring markets closely related to the directly concerned markets.

If the parties are actual or potential competitors in at least one of the relevant markets then a production agreement between them is more likely to raise competition issues. If a production agreement relates to an important input which could enable the cooperating parties to raise the costs for their rivals in a downstream market this could result in foreclosure of third parties which would be regarded as a competition issue by the Commission.

A production agreement is regarded as being unlikely to lead to restrictive effects on competition if the parties to the agreement do not have market power in the market on which a restriction of competition is assessed. If the parties' market share does not exceed 20% they may fall into the specialisation block exemption provided that they fulfil all the necessary criteria. Below this level it is assumed that specialisation agreements will be beneficial in terms of economies of scale or scope or better production technologies while allowing consumers a fair share of the resulting benefits.

This form of cooperation is probably less relevant for any system or software that emerges from the LOGISTAR project as horizontal co-operation in logistics does not affect, as such, production.

[12] See specialisation block exemption, Article 1(1)(b)
[13] See specialisation block exemption, Article 1(1)(c)
[14] Horizontal Guidelines paragraph 153

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(iv) Purchasing agreements

Through joint purchasing smaller businesses, SMEs, can achieve volume discounts comparable to their larger competitors which in turn improves the level of competition in the markets in which they compete.

There are two types of relevant market in which the parties to the purchasing agreement market power needs to be assessed: the purchasing market and the selling market. Competition concerns arise where the parties have a significant degree of market power on the purchasing market because they could force their suppliers to decrease the range and quality of the products they produce or they could limit competing businesses access to the supplier's products.

Joint purchasing agreements can be a cartel by another name, which means that the Commission will look at the agreement as a whole in relation to Article 101(1).

A safe harbour exists for parties that do not have significant market power which is defined as less than 15% of the purchasing market plus a combined market share of less than 15% of the selling market.

This form of cooperation is probably less relevant for any system or software that emerges from the LOGISTAR project as horizontal co-operation in logistics does not affect, as such, purchasing. It could be said that in the case of horizontal collaboration between two or more shippers, the LOGISTAR system will enable these shipper to buy transport capacity from their joint Logistics Service Provider (LSP) in a collaborative manner. In any case, before activating the LOGISTAR system, the shippers will need to negotiate which shared LSP they will use and at which price and service level.

(v) Commercialisation agreements

Where parties enter into joint agreements relating to selling, distributing or promotion of products this is defined as a commercialisation agreement. The scale of the joint cooperation may be extensive involving all commercial aspects relating to sales, including price setting, or more limited to cooperation only in the area of marketing such as distribution, after-sales service or advertising.

The principal competition issues are price-fixing, output limitation, division of the market geographically or according to customers and the exchange of strategic outcome which leads to a restriction on competition.

There is no block exemption for horizontal commercialisation agreements but there is a safe harbour if the parties do not have market power to a significant degree, less than 15%.

The key issue for LOGISTAR is that the system or software is likely to support horizontal co-operation relating to the physical distribution of products. As this might include sharing some data on sales volumes that are relevant to securing the benefits from collaboration it might be construed as being an exchange of strategic outcome. In reality, it is the LSPs that are most likely to have more knowledge of shippers' volumes.

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(vi) Standardisation agreements and standard terms

A standardisation agreement can cover the product or service for which the agreement is put in place, the intellectual property rights if it is a technology market, the standards set and by which body, and testing and certification of the products or services. It usually defines the technical or quality requirements for the product or service, or production processes or methods.

The principal issues from a competition perspective are whether the standardisation agreement results in restrictions in price competition and or whether it limits or controls production, markets, innovation or technical development.

There is no block exemption for standardisation agreements specifically. The Horizontal Guidelines set out how to ensure that the process of choosing industry standards is competitive and allows access on fair, reasonable and non-discriminatory grounds. Participation in standard-setting should be unrestrictive, transparent, and not obligatory for competitors in the relevant market.

Standard terms are used by companies in certain industries. These can lead to restriction on competition where they lead to limited product choice and stifled innovation because a large part of the industry accepts the standard terms. The Horizontal Guidelines[15] states that if the use of the particular standard terms is open to all competitors in the relevant market and they are non-binding then the terms are not likely to restrict competition.

Assessing the standard terms potential impact on competition takes into account: existing competitors in the relevant market, market share of the parties defining the standard terms, what the standard terms cover and how necessary these terms are to selling a certain product.

This form of cooperation is probably less relevant for any system or software that emerges from the LOGISTAR project as horizontal co-operation in logistics does not affect, as such, standards.

Benefits from horizontal agreements

It is conceivable that a horizontal agreement has sufficient benefits to meet the four exemption criteria:

1. Efficiency gains: the agreement between the parties must contribute to improving production or distribution, or to promoting technical or economic progress. Examples of such gains might include lower prices, better quality or faster innovation. Claims need to be substantiated and must be net positive and capable of verification.

2. A fair share for consumers. A share of the benefits must be passed on to consumers and there is an analytical framework that should be used to assess these.

[15] Horizontal Guidelines para 301

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3. Indispensability. The agreement has to be reasonably necessary to achieve the efficiencies.

4. No elimination of competition. The collaboration must not lead to elimination of competitors in a substantial part of the relevant market.

In which case, Article 101 would not apply.

The application of the LOGISTAR software or system to specific instances of horizontal collaboration between two or more companies would need to be justified based on the above mitigating factors. It should be possible, as a general rule, to show that the application of LOGISTAR would:

- Achieve efficiency gains for the cooperating parties in terms of lower costs;
- Result in benefits for consumers in terms of lower prices as the efficiency gains are passed on through to retail prices and in terms;
- Be 'reasonably necessary' as the result would be lower environmental externalities, which helps to meets both European and national policies on the need to reduce environmental pollution and greenhouse gas emissions;
- Not result in a lowering of competition as it involves collaboration only in relation to physical distribution of products.

3.3.2. Vertical cooperation

The concept of vertical agreement covers the process whereby companies enter into relationships in order to get their goods or services to market with companies operating at different levels of trade. In a vertical relationship the product or output of one business is the input for another. Common vertical agreements include distribution and purchasing agreements, agency agreements and industrial supply contracts.

In a vertical agreement the exercise of market power by one party, whether the upstream supplier or the downstream buyer, may harm the interests of the other party in the agreement so there is therefore an automatic control to prevent unreasonable restrictions being written into the agreement. The parties together having a high degree of market power is where competition concerns would arise. That is, where the constraints which would usually ensure that an undertaking behaves in a competitive manner are not working effectively and businesses are able to raise prices over and above competitive levels.

The Commission's Vertical Guidelines[16] set out the potential effects on competition which all relate ultimately to the potential for foreclosure of competitors, and or higher prices, or lower quality of goods or services. The harmful effects on competition fall generally within the following headings:

- **Raising barriers to entry** which can lead to reduced competition and ultimately higher prices for customers.

[16] Guidelines on Vertical Restraints (OJ 2010 C131/01, 19.5.2010)

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- **Reduction of competition between brands;** leading to collusion between competing buyers or suppliers whether on pricing or something else.
- **Reduction of competition between distributors of the same brand;** this matters if there is only one brand or a limited amount of inter-brand competition.
- **Creating barriers to trade between member states;** any sharing out of pieces of market whether geographically or otherwise that effectively creates obstacles to cross-border trade. This would include preventing purchase of goods or services in particular member states and not others.

Whether a vertical agreement has any of the above effects on a relevant market within the EU needs to be assessed and it will depend on the nature and levels of competition within the relevant market.

The Commission's 2014 De Minimus Notice[17] says that SMEs, with fewer than 250 employees, and an annual turnover of less than €50m or assets of less than €43m, that have entered into a vertical agreement will not normally be subject to investigation. Larger, competing undertakings where the parties to the agreement do not have a combined market share of more than 10% will not be investigated. If the companies in the vertical agreement are not competitors then this threshold rises to 15%.

This is all subject to the caveat that the vertical agreement does not have the object of preventing, restricting or distorting completion. If there is no appreciable effect on competition by the agreement then even companies entering into a vertical agreement that are above the market thresholds may not be investigated by the Commission.

Where an agreement does not affect trade between member states then the national competition rules will apply instead.

The Commission operates a vertical agreement block exemption regulation or VABER[18]. There are Vertical Guidelines that accompany this regulation[19]. Essentially the VABER provides a "safe harbour" for agreements that meet certain formal conditions regardless of whether there is a positive or negative effect on competition in the relevant market. The VABER fixes the Article 101 market power threshold at 30% but it is often difficult to define exactly what the boundaries of the relevant market are with respect to vertical agreements. A detailed analysis has to be undertaken in each case using the Vertical Guidelines as a tool for the step by step analysis.

Where an agreement does not fulfil the exemption criteria of the VABER then it is assessed as to its effects on competition via the principles of Articles 101 and 102.

[17] OJ 2014 C291/1, 30.8.2014
[18] Commission Regulation (EU) 330/2010 (OJ 2010 L102/1, 23.4.2010)
[19] Guidelines on Vertical Restraints (OJ2010 C131/01, 19.5.2010)

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Analysis of vertical agreements for Article 101(1)

1 Is there an appreciable effect on trade between Member States? If not, then EU competition rules will not apply, though national ones may still. It is rare for SMEs to be able to affect trade between Member States significantly.

2 Does the agreement include any "hardcore" restrictions, i.e. the object of restriction on competition?

3 What are the relevant markets? The definitions of these relate to the block exemptions' market share thresholds as well as general thresholds.

4 Significance of other factors including:

- Nature of the agreement: whether it includes restraints on trading activities of any description even if implicit.
- The parties' market position: market share, brand strength, first mover advantage etc.
- Competitors' market positions: the stronger the competitors and the greater their number, the less risk there is that the parties can exercise market power and cause foreclosure of competitors.
- Entry barriers: regulatory, scale economies, resource access, brand loyalty etc.
- Maturity of the market: a stable or declining market is more likely to suffer negative effects of reduced competition.
- Level of trade in the vertical chain: e.g. distributors who respond directly to customers demand may suffer where they do not have access to sell certain brands.
- Buyer power: where a buyer can encourage new entrants this can prevent the parties exercising market power.
- Nature of goods or services; if the goods or services are strongly branded then restraints on distribution and selling may have negative impacts.
- Other considerations such as the regulatory context, the effect of combinations of vertical agreements and so on.

If an agreement is caught by Article 101(1) it may be that the parties can demonstrate that the agreement has sufficient benefits to outweigh any threat to competition. There are 4 criteria that the agreement must achieve:

- It must offer efficiency gains by contributing to improving production and or distribution or technical or economic progress
- It offers consumers a fair share of these efficiency gains
- It does not impose any vertical restraints on the undertakings which are not required in order to realise the efficiency gains
- It does not effectively assist the undertakings to eliminate competition for a substantial part of the goods or services in question.

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The Vertical Guidelines set out how the common types of vertical restraint are analysed. An agreement may contain a combination of the following and they are all examined to assess the impact on competition:

- Single branding – where the buyer is restricted to placing all or most of its orders with one particular supplier
- Exclusive distribution – the distributor is usually limited into selling the contract goods into the territories that it has been allocated
- Exclusive customer allocation – the distributor is limited to selling to one, defined, particular set of customers
- Selective distribution – there is a restricted number of authorised distributors who may not resell to other not authorised distributors
- Franchising – often includes clauses of selective and exclusive distribution as well as 'non-compete' clauses
- Exclusive supply – where the supplier is induced or obliged to sell products only or mainly to one buyer
- Upfront access payments – where access to a distribution network requires payment of a fixed fee paid by the supplier to the distributor
- Category management – where the distributor entrusts the supplier with the marketing of a category of products including those of competitors
- Tying – where the customer of one product is obliged to buy another distinct product
- Resale price maintenance – where the buyer's freedom to determine its resale prices is restricted.

Again, as with horizontal cooperation there are many ways in which competition law potentially impacts upon vertical agreements and each case has to be assessed against the criteria for competition.

3.4. Competition law as it potentially applies to logistics partners

There have been various European research projects looking at ways in which transport within the EU can be made more efficient, and studies which have examined the working of supply chains crossing boundaries between Member States. One such study, the CO3 project[20], sought to establish legal frameworks for horizontal cooperation between shippers in the supply chain and it examined, as part of the work, competition law in relation to this. A key component of the contractual framework proposed was the introduction of a 'trustee' in order to reduce the competition law risks of information exchange between shippers as part of their collaboration. The idea is that each shipper contracts with the trustee and the latter would be the only party that received price and volume information for all of the shippers and, in turn, relate to the logistic service providers. The trustee is a neutral, impartial, external third party in the legal structure and is the entity that will advise and make possible the horizontal collaborations. This trustee effectively carries out the functions akin to a freight forwarder, i.e. the practical

[20] Co3 project: www.co3-project.eu

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processes, as well as being the neutral entity receiving information from the parties in order to facilitate the collaborations.

Leaving aside the 'hardcore' restrictions which would automatically make an agreement fall under Article 101(1) (set out in an earlier section) horizontal collaboration between parties that cannot otherwise independently carry out the project or activity covered by the collaboration would not generally be regarded as anti-competitive. In the context of transport and logistics, an example of this is a case where railway undertakings were unable to offer new services alone and needed to cooperate in order to offer the spare capacity in a viable way. Their collaboration did not therefore infringe Article 101[21].

The CO3 project examined relevant aspects of the Horizontal Guidelines for its own concept and these have some parallels for LOGISTAR. In particular there was discussion around the nature of information exchange, which is an important facet of Article 101. Given that CO3 is about horizontal cooperation between shippers, the lessons drawn by the project team are worth reiterating here.

Information exchange and horizontal collaboration between shippers

If we consider 'information exchange': the term 'exchange' can cover both one-way and two-way exchange. The CO3 team concluded that it would be important that the horizontal agreement between the shippers included a specific clause that stated that the parties did not want to receive the identifiable information from each other. In the case of CO3 it would only be the Trustee that had an active role in the participation. Thus the individual shippers will disclose information with respect to their cargo volumes only to the Trustee and not to each other. The Trustee is obliged to keep this information confidential and will only use the information for each shipper when required in order to combine the flows together. The Trustee will keep information about the precise allocation of freight costs confidential. Carriage contracts with respect to a specific cargo will be entered into by the individual shippers with the individual logistics service providers directly. The Trustee will not become a party to those carriage contracts. The information collected by the Trustee should not lead to the Trustee influencing price in the market. However, it should be noted that what happens in practice, even if inadvertent, will have a bearing on whether competition law is suspected to be infringed.

The competitive outcome of an information exchange depends on the characteristics of the market in which it takes place and then on how that information exchange may alter those characteristics. It seems that the CO3 team identified that the transport sector has a special place in the Commission's competition policy.[22] The main problems when applying the competition rules in the transport sector are restrictions such as price fixing, capacity and market sharing and collective refusal of access to essential facilities under Article 101. The substantive rules of the special transport regulations are designed to be interpreted in the same way as Article 101.

[21] European Night Services, D.Comm. oct 21,, 1994, 1994 OJ L25/20, paragraphs 139-147

[22] The Council issued special regulations with respect to the transport sector: for road, rail and inland waterways, 1017/68, sea transport 4056/86 and air transport 3975/87 snf 2410/92.

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The nature of the information exchange is important. In particular the exchange of 'strategic' information between only a few parties in the relevant market to the exclusion of others, so that it is a competitive disadvantage not to be party to the information exchange is anti-competitive. Commercially sensitive information may be legitimately disclosed in the context of negotiating an agreement and fixing its terms but not once that process is concluded. Everything hinges around whether a market can adjust in the light of this new information, and in which case, there would be an anti-competitive effect. However, if market supply conditions are already set at the time of conclusion of negotiations then no anti-competitive effect is likely to be generated. Also, the older the data exchanged, the more difficult it is for competitor behaviour to be anticipated. Publicly available information being exchanged is not likely to constitute an infringement of Article 101(1) as this kind of information is generally equally available to all competitors and customers. There are other characteristics of information relating to whether it is aggregated or individualised, is it exchanged directly or indirectly through a third party, how frequent are the exchanges, and are there confidentiality safeguards, all of which have a bearing on whether the information exchange may have a detrimental effect on competition.

The CO3 project, in identifying the role of the Trustee, suggests that information regarding volume/quantity data will be shared with the Trustee and so will some information concerning transport costs, "in order to facilitate a high standard of sustainable transport". The report cites the example of the T-Mobile case where the Court ruled that:

"An exchange of information between competitors is tainted with an anticompetitive object if the exchange is capable of removing uncertainties concerning the intended conduct of the participating undertakings".

This must be borne in mind in assessing the horizontal collaboration.

3.5. Mitigation of risks of being investigated by EU Competition Commission

There are numerous pitfalls with respect to EU competition law, but a consideration of the criteria and thresholds that trigger investigation in the design of the LOGISTAR tool will assist greatly in preventing breaches of competition regulations.

Firstly it is important the LOGISTAR system in itself minimises any possible adverse market dominance. That is to say, were LOGISTAR to become the platform of choice in its target markets it should ensure that its possible dominance does not adversely affect the market.

In anticipation of potentially exceeding a market size threshold LOGISTAR should aim to maximise the benefits of efficiency and the consumer's share of the benefits while making sure that this can be measured and verified somehow. It should also maximise the other wider benefits of the system, such as the reductions in carbon emissions as a result of collaboration between shippers and their LSPs.

It is extremely important in the design of the LOGISTAR tool to ensure that no 'strategic information' exchange is possible whether this is by design or default. It is no defence to plead that any strategic information exchange that occurs because of the use of LOGISTAR was not

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meant to happen. The Commission will not be sympathetic to this argument so the tool must be designed in such a way as to prevent this occurring at all cost. LOGISTAR could become an electronic version of a 'neutral trustee' of data.

One of the ways in which LOGISTAR can mitigate any risk of distorting the market by restricting participants is to allow open access and participation by market players irrespective of their size.

Finally, it is necessary to ensure as much transparency in the LOGISTAR system as possible without compromising the rules of information exchange and confidentiality.

Competition law is notorious for being open to interpretation and is dependent on the definitions of addressable market and market size and so on. It would be prudent to ensure that legal opinion is sought on the competition law aspects in advance of launching a commercial product.

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4. General Data Protection Regulation (GDPR)

4.1. Introduction to GDPR

GDPR stands for General Data Protection Regulation; it is at the centre of the European Union's digital privacy legislation. This new EU framework applies to organisations in all Member States and has implications for businesses and individuals across Europe, as well as further afield (where companies outside Europe interact with European citizens they are obliged to conform to the data protection legislation).

GDPR is a set of rules aimed at giving EU citizens more control over the storage and use of their personal data. The rules govern personal data privacy and consent across Europe to protect consumers using the internet.

Under the terms of GDPR organisations have to ensure that personal data is gathered legally and under strict conditions. Those who collect it and manage it are obliged to protect it from misuse and exploitation and respect the rights of data owners. There are significant penalties for data breaches.

Personal data is any information relating to an identified or identifiable person. It includes data such as name, address, identification numbers, location data and IP addresses. Further detail of racial or ethnic origin, political affiliations or opinions, religious beliefs and health data are defined as sensitive personal data which are subject to higher thresholds for handling and processing and therefore require more rigorous controls on the part of organisations collecting and processing this data.

Processing of personal data for the purposes of GDPR is defined as, " any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means, such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction."

The GDPR requires that personal data must be:

- Processed lawfully, fairly and transparently
- Collected (and processed) for specified, explicit and legitimate purposes (the purpose limitation)
- Adequate, relevant and limited to what is necessary for the purpose for which they are processed (the principle of data minimisation)
- Accurate and kept up to date
- Retained (i.e. kept in an identifiable form) for no longer than is necessary for the purpose for which they are processed (the storage limitation) ,
- Processed securely.

The GDPR also requires that all processing of personal data must have at least one of a defined list of legal bases which include the following:

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- Processing based on the relevant individual's specific, informed, unambiguous, freely given and revocable consent
- Processing necessary for the performance of a contract with the relevant individual
- Processing necessary for the compliance with a legal obligation, and
- Processing necessary for the legitimate interests pursued by the controller or a third party (except where such interests are overridden by the interests or fundamental rights and freedoms of the data subject).

There are two different types of data-handlers defined in the legislation: 'processors' and 'controllers'. A data processor processes personal data on behalf of a data controller, under mandatory contractual provisions set out in the GDPR. A data controller, whether alone or with another data controller, has primary responsibility over the processing of personal data and determines the purpose and means by which the data is processed.

The GDPR includes an overarching obligation on data controllers to move towards data protection by design and by default (privacy by design) and they must put in place appropriate technical and organisational measures that ensure data protection is integrated into all personal data processing activities and business practices, from the initial design stage onwards.

4.2. Implications for LOGISTAR

The most effective way to deal with GDPR for LOGISTAR is to ensure that no personal data is processed as part of the software solution. This may not be practical as the breadth of the definition of personal data is large.

One of the problem areas is that personal data can include unique identifiers assigned to an individual such as an IP address. If any individual's IP address is recorded against information transactions on the LOGISTAR tool and it is possible to link that IP address to the identity of the individual then this is classed as personal data under the GDPR. Even if a person is only indirectly identifiable this is classed as personal data, as if it is brought together with other data it may then enable identification of an individual.

The way to fix this potential problem is to ensure that all participants on any LOGISTAR network are corporate entities and not individuals. Emails such as info@company are preferable to name@company and so forth. It may also be possible to encrypt any identifiers but this may complicate the software challenge.

It is possible that personal data ends up on the LOGISTAR network inadvertently as part of a transaction. Such data might be an individual's name, address, phone number, email address or other contact or identifying details. This could happen as a result of recording of:

- An email address for invoicing which involves a person's name;
- A commercial transaction that includes the name of the individual completing the transaction;
- A photograph in a live tracking situation that includes an identifiable living person;

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- A contract that includes the name of an individual signing the contract on behalf of one of the parties.

One way to try to prevent personal data being uploaded to any LOGISTAR network would be to put in place a contractual governance framework that obliges individuals not to upload personal data to the network and minimises free form data. Another would be to use technological measures by avoiding fields for personal data such as names, phone numbers or email addresses. AI or machine learning based tools can be employed to recognise faces in images for example.

Such a contractual governance framework needs to cover:

- Data processing agreements, identifying the roles of the data controllers and the data processors, as each of those have different provisions but both are required to document the subject matter and duration of the personal data processing, the nature and purpose of the processing, the type of personal data and categories of data subjects implicated by the data processors processing. In addition the data processors are required to agree to only process data on documented instructions from a data controller and to preserve the confidentiality of the data.
- Joint data controller agreements where two or more data controllers jointly determine the purposes and means of processing, as outlined in Article 26 of the GDPR. They must transparently determine how they will ensure GDPR-compliant treatment of data subjects' personal data and what each data controller's relationship will be with data subjects. Members of a LOGISTAR network would most likely be joint data controllers as they will jointly determine the purpose and means of processing data for the relevant LOGISTAR process. The data controllers must make at least a summary of their arrangement available to the data subjects.
- Restrictions on transferring personal data out of the EEA. A governance framework could incorporate the model international data transfer clauses so that network members agree to treat personal data in a way that satisfies the requirements of the GDPR principles and then the location outside the EU does not matter.
- Fair processing notices. Through the governance framework organisations subscribed to the LOGISTAR tool would be able to comply with Articles 13 and 14 of the GDPR which oblige data controllers to provide data subjects with fair processing information, essentially privacy notices. When any personal data is collected, whether directly or indirectly, the data controller must provide the data subject with their contact information, the purposes for which the data is being processed, who is or will be in receipt of that personal data and whether the data is likely to be transferred outside the EU. The data controller should also remind the data subjects of their rights under the GDPR to access, rectification and erasure of their personal data.
- A clear governance framework will identify the roles and responsibilities of those that subscribe to the LOGISTAR tool as well as those that manage all or some of its aspects with respect to personal data and the GDPR. There will be other issues that a governance framework would cover, which are not the subject of this paper ut, in respect of data protection and privacy, the governance framework should:
- Be contractually binding on all participants in the LOGISTAR network

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- Put in place the GDPR-required provisions for data processing, joint controllers, model clauses for data transfer outside the EU and making fair processing notices available
- Put in place a process for data subject to be able to exercise their GDPR rights, such as erasure and facilitating communication between data controllers when requests to delete personal data is received by one of them
- Establish the means of achieving data minimisation, privacy by design, risk mitigation and permit removal of personal data that is no longer required.

In addition to the establishment of a detailed contractual governance framework there needs to be mechanisms in place to address GDPR requirements relating to the data subject's rights to request deletion of their personal data or rectification if it is not accurate.

The data minimisation obligation will be satisfied if the data are limited to what is necessary for the purpose for which they are processed. The right to erasure does not require deletion of personal data if a valid purpose exists to process that data, such as legal requirements. It is very likely that personal data will no longer need to be retained after a period of time and Article 5 of the GDPR requires deletion of personal data by the data controllers if it is no longer needed. The LOGISTAR network must therefore enable deletion of that personal data.

Data subjects' right of rectification applies to the right of correction of inaccurate personal data as well as the right to complete incomplete personal data. This is an unqualified right, so the exceptions with respect to data erasure referred to in the paragraph above do not apply. The LOGISTAR network must enable these actions to be carried out by the data controllers where relevant.

The personal data likely to be involved in the LOGISTAR network will depend on how the software ultimately deals with contractual arrangements between parties and the nature of the information that is transferred between parties when logistics movements are planned and executed. However, they are likely to be limited to the following:

- Names of people signing some shipping and transport documents;
- Business contact details of certain individuals involved in the transport process such as telephone numbers and email addresses;
- Images of events that occur in the transport chain that may include recognisable individuals or other personal data.
- Position, direction, speed and departure/arrival/pick-up and delivery times of the vehicles taking part in testing activities

These personal data should not be visible to all LOGISTAR network participants, rather only to those for which it is directly necessary.

It should be possible for the LOGISTAR developers to implement technological solutions to identify personal data submitted to the network and prevent it from so being. Solutions might be as mentioned earlier: restricted data fields so that data formats containing personal data cannot be submitted or artificial intelligence solutions that screen all submitted data for personal data and flag it for review or redact personal data from the data submitted. An artificial

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intelligence solution would help to ensure no delays in submitting and therefore transmitting appropriate data.

Where personal data nevertheless still enters the network, albeit inadvertently, implementing the governance framework and the screening and prevention mechanisms will provide evidence in mitigation of the risks of being non-compliant with the legislation because a demonstrable commitment to be compliant and implement privacy by design is clear to see.

In order to compy with the implications that the GDPR has for LOGISTAR explained above different measures and procedures have been put in place. Please refer to the following deliverables for more information:

D10.1 - How data protection will be ensured in the case of potential transfer of personal data to non-EU countries (in particular, to Serbia since there is one Serbian partner in LOGISTAR consortium that will have access to the data to be gathered).

D10.2 – Informed consent procedures to be implemented

D10.3 – General proecedures in relation with data collection, storage, protection, retention and destruction in order to comply with national and EU legislation inluding GDPR to be implemented in LOGISTAR

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5. Conclusions

5.1. Policy Conclusions

The policy review shows that the LOGISTAR project appears to fit well within a wider EU policy context of transport, most notably through the themes of facilitating the smooth and efficient movement of goods. The real-time decision making aspirations of the project embrace the wider goal of embracing new technology to improve traffic management and improve sustainable mobility.

This will also be met through greater industry collaboration in moving goods and will lead to a reduction of emissions within the project itself through shortened journeys and increased load factors. However, LOGISTAR does not embrace emissions reductions directly through the use of electric vehicles or cleaner fuels - a major theme within the EU policy context – as the tool would be mode neutral in its potential application. Land use planning is not something that is covered directly by the project, although this can have a significant impact on the efficiency and sustainability of logistics flows.

LOGISTAR appears well aligned with the aims of the digital single market, pursuing themes such as interoperability and enhanced travel information systems. The theme of improving access for businesses in the context of digital services is also followed, as well as the wider theme of e-freight and tracing goods in real-time.

5.2. EU Competition Law Conclusions

Competition law is complex and requires analysis of each and every case against the criteria set out in Articles 101 and 102. The Commission expects companies to undertake a self-assessment and will investigate when third parties make complaints or representations. The design of the LOGISTAR tool must take into account the prospect of affecting trade between Member States first and foremost. If this is judged unlikely then there is no competition issue at the EU level to address. There may still be issues for National Competition Authorities but they are not the principal subject of this paper.

Even where trade is deemed to be unaffected initially, if the tool were to be very successful it has the potential to influence trade between Member States; in which case it is sensible to make sure that the software incorporates the necessary safeguards with respect to information exchange. This should also ensure that parties will not fall foul of national competition regulations if any party is particularly dominant in one Member State.

Since the ultimate goal of LOGISTAR is to make transport and the logistics supply chain more efficient there should be means of measuring and verifying any efficiency or other benefits.

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5.3. GDPR conclusions

LOGISTAR should aim to keep personal data off the LOGISTAR network as far as it is possible. The network should be designed to only collect and store data that are adequate, relevant and limited to what is necessary for the purpose for which they are processed and to comply with data subjects' rights (particularly those of erasure and rectification).

All participants to the LOGISTAR tool should sign the governance framework to show their agreement with the data protection and privacy (as well as other issues and concerns) approach of the network before being permitted to participate. This framework should document all of the obligations of the participants in a transparent way.

Ideally technological mechanisms should also be put in place to prevent uploading of personal data to the software platform and process. Privacy by design should be at the core of the data protection elements of the software and process.

The governance framework should cover all of the following:

- Prohibit LOGISTAR participants from uploading personal data;
- Oblige all data processing within LOGISTAR to abide by Article 28 of the GDPR and other relevant clauses;
- Incorporate the European Commission's model international data transfer clauses;
- Set out the way in which LOGISTAR participants, where they are data subjects, are able to exercise their rights (in particular to rectification and erasure).

It is likely that the risks for LOGISTAR are small because it should only carry very limited and non-sensitive personal data but it is important that the tool and the network demonstrates that it makes every possible effort to ensure compliance under the GDPR.

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List of abbreviations and acronyms

3PLs	Third Party Logistics Providers
4PLs	Fourth Party Logistics Providers
EEA	European Economic Area
EU	European Union
FTL	Full Truck Load (as opposed to LTL or Less than Full Truck Load)
GHG	Greenhouse Gases
IPR	Intellectual Property Rights
ITS	Intelligent Transport Systems
LSP	Logistics Service Provider
NCA	National Competition Authority
R&D	Research and Development
SME	Small and Medium Size Enterprises
TENT-T	Trans European Transport Network
TFEU	Treaty on the Functioning of the European Union
WTO	World Trade Organisation

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Annex: Logistics Supply Chain Models

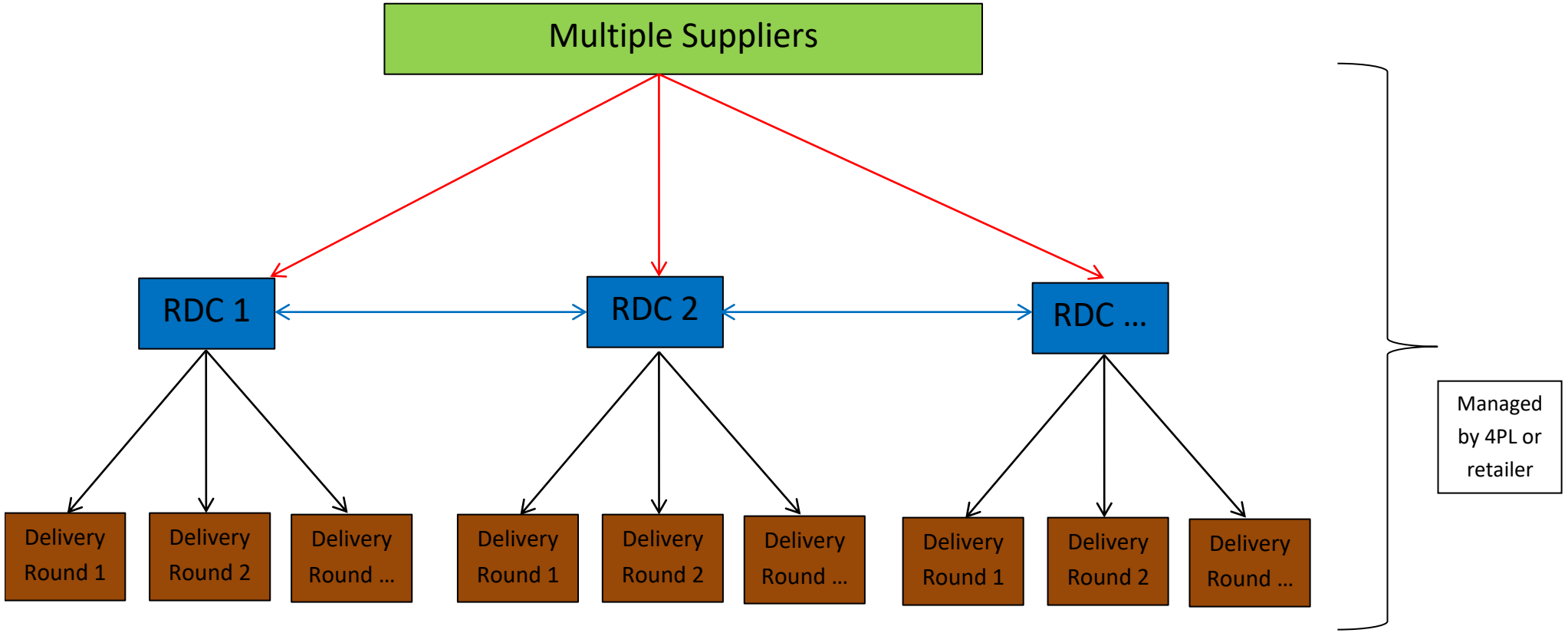

Figure 1 Flow Diagram – E-Commerce Supply Chain 1

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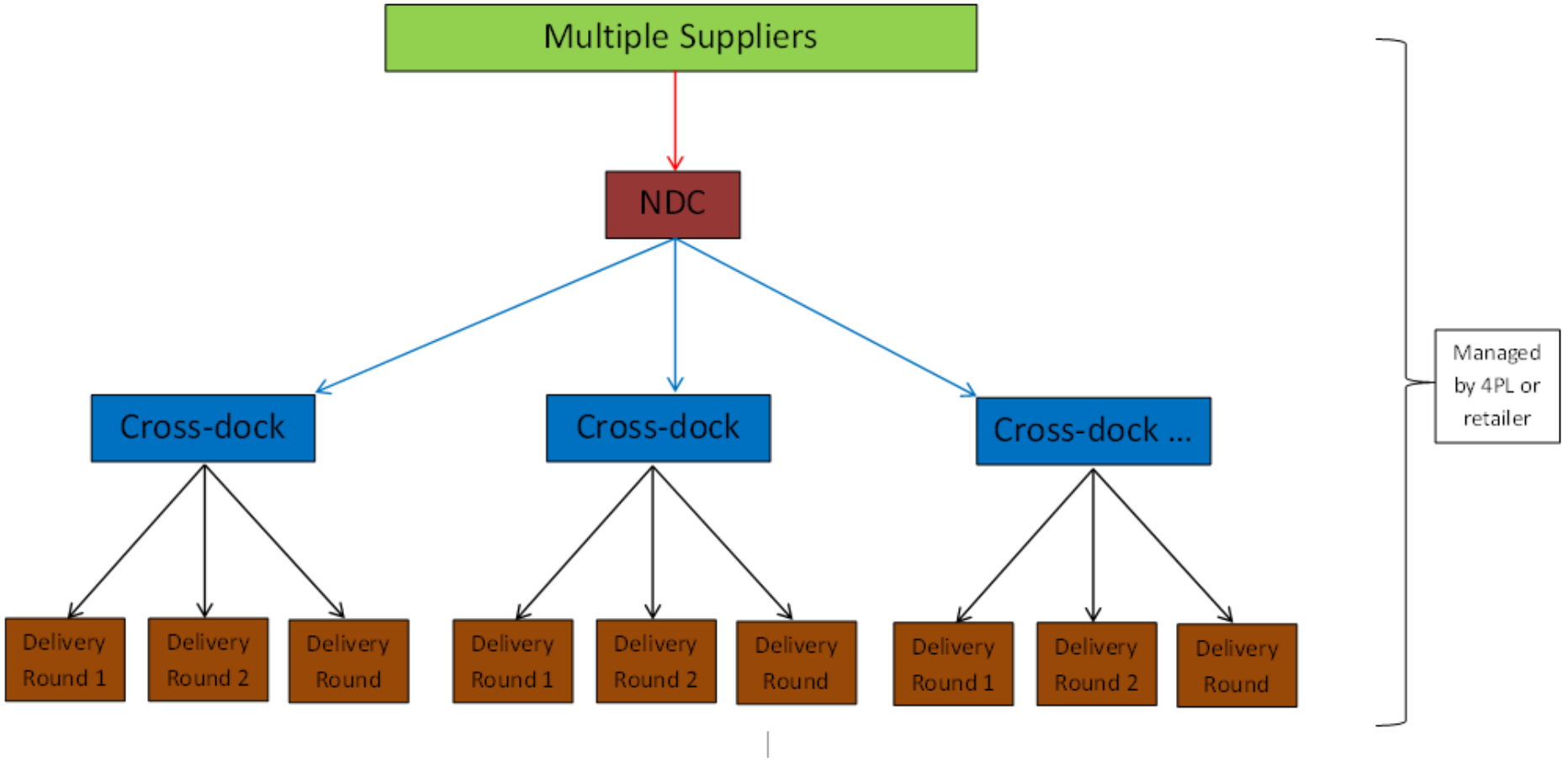

Figure 2 Flow Diagram – E-Commerce Supply Chain 2

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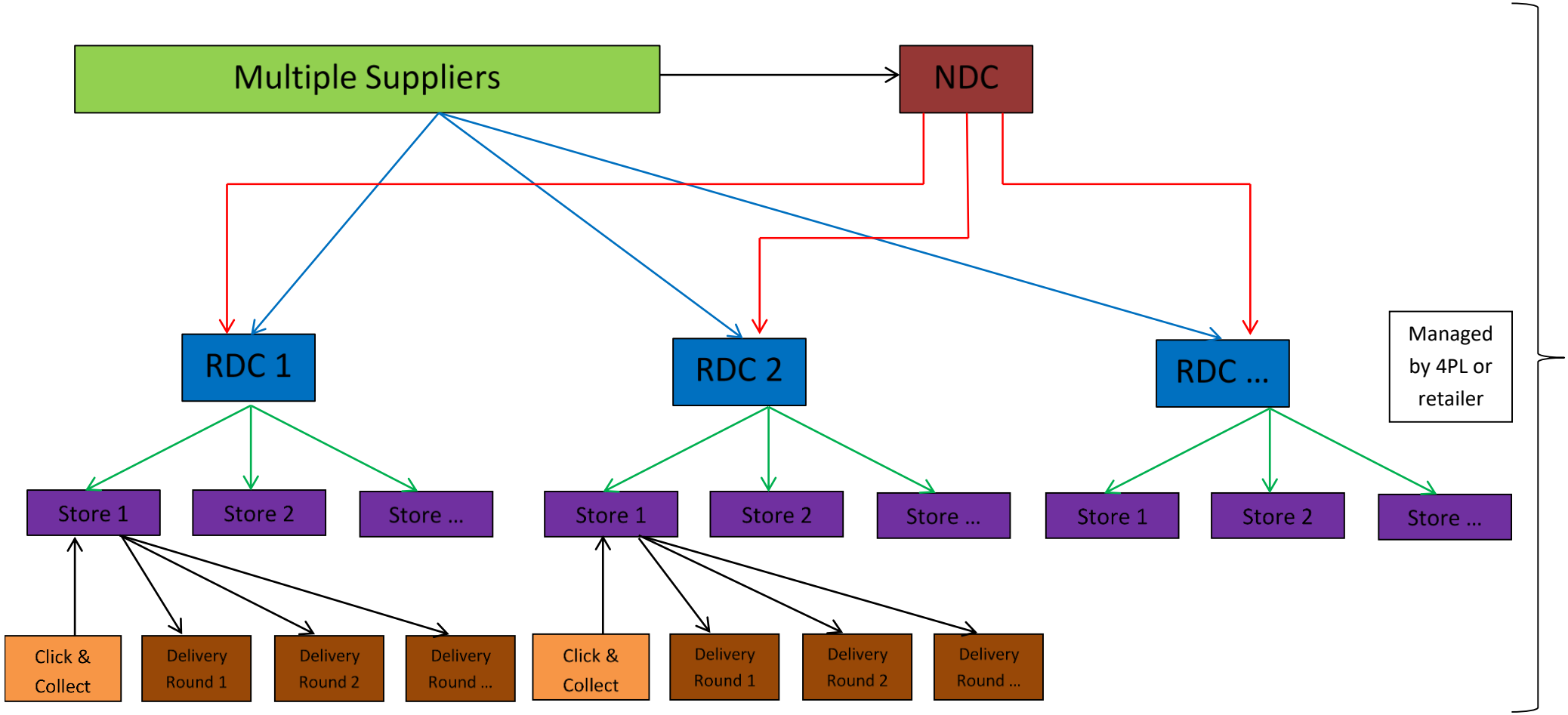

Figure 3 Flow Diagram – Bricks & Mortar plus E-Commerce from Store Retailer

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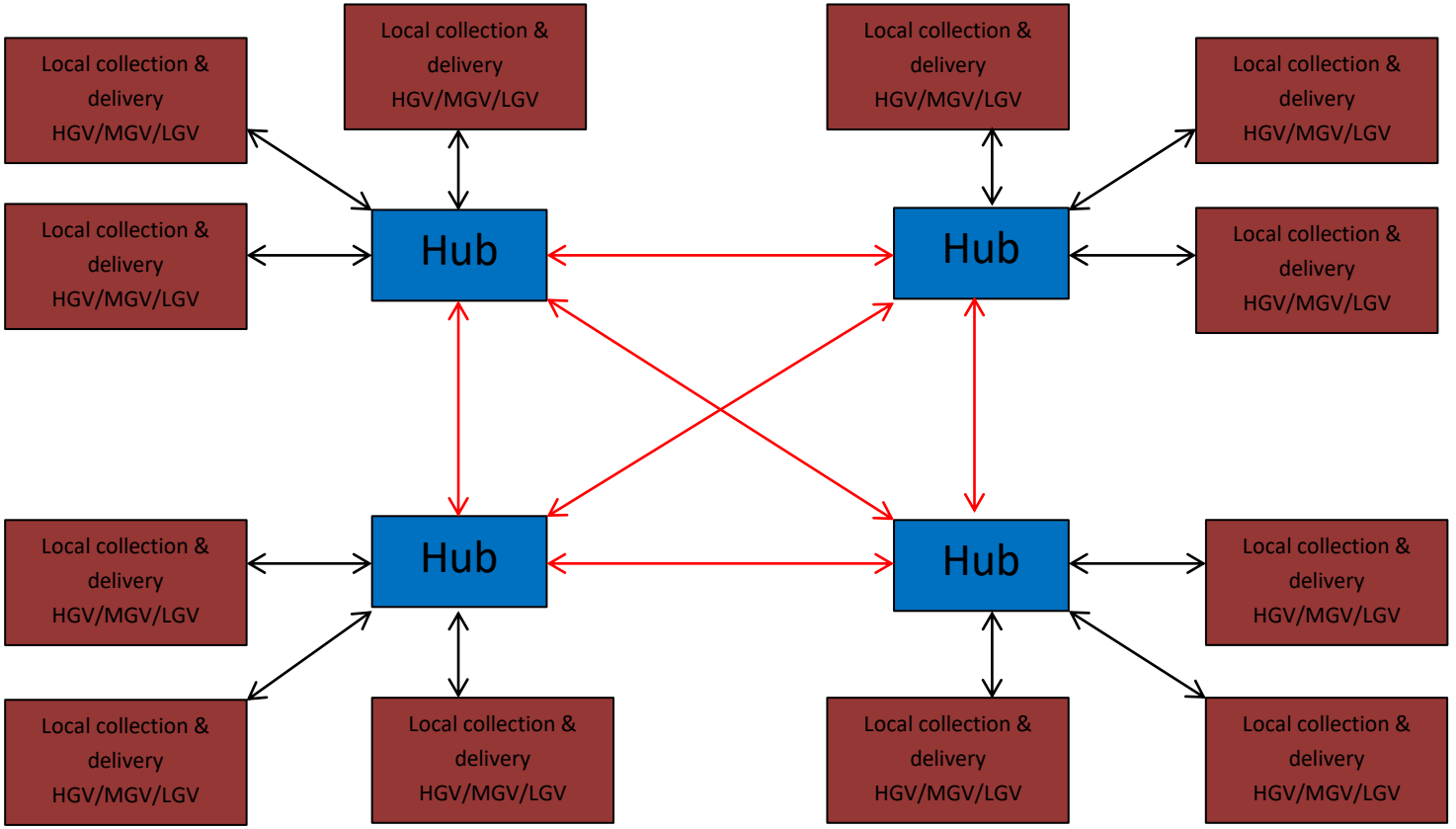

Figure 4 Flow Diagram – Shared User Networks

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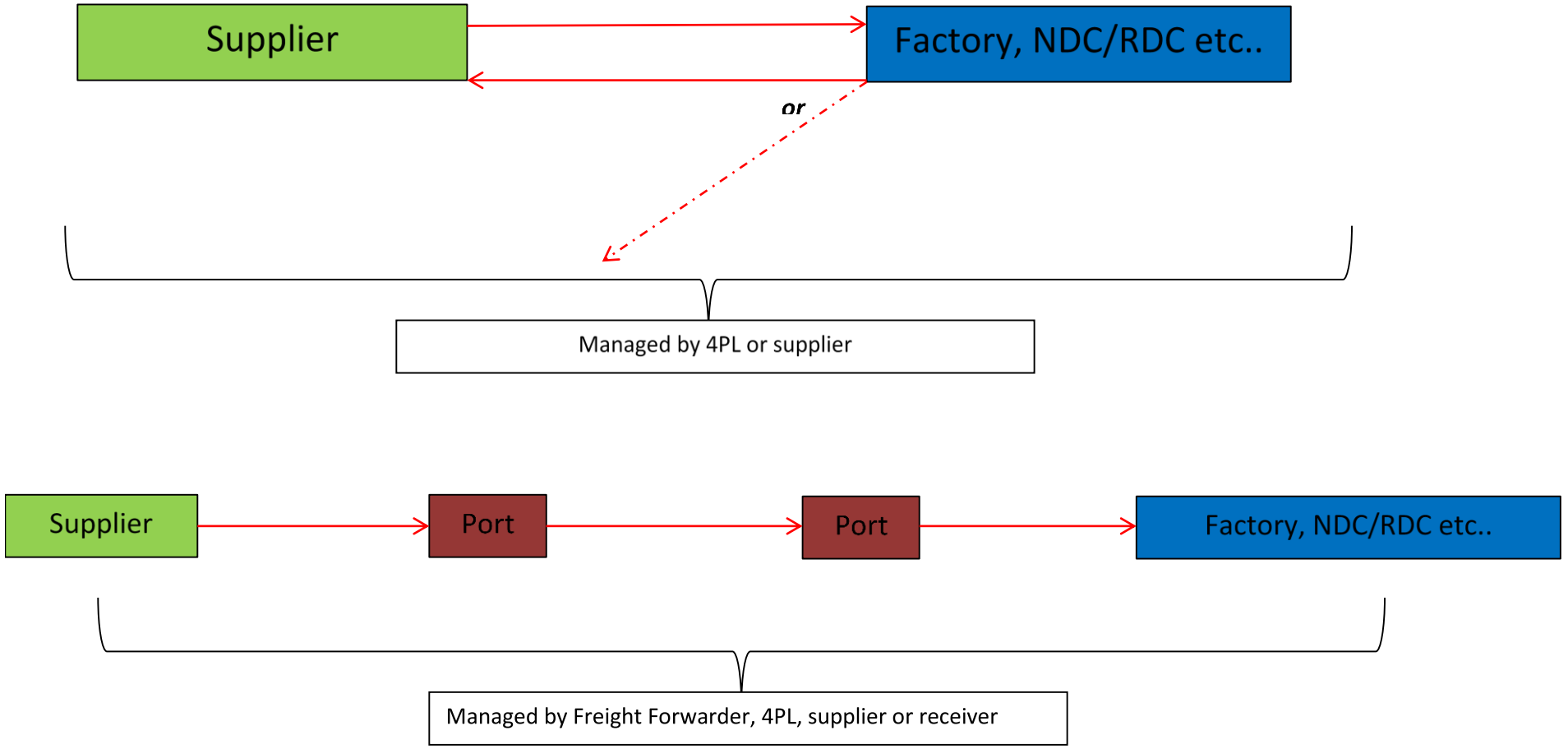

Figure 5 Flow Diagram – Basic Supplier to Retailer

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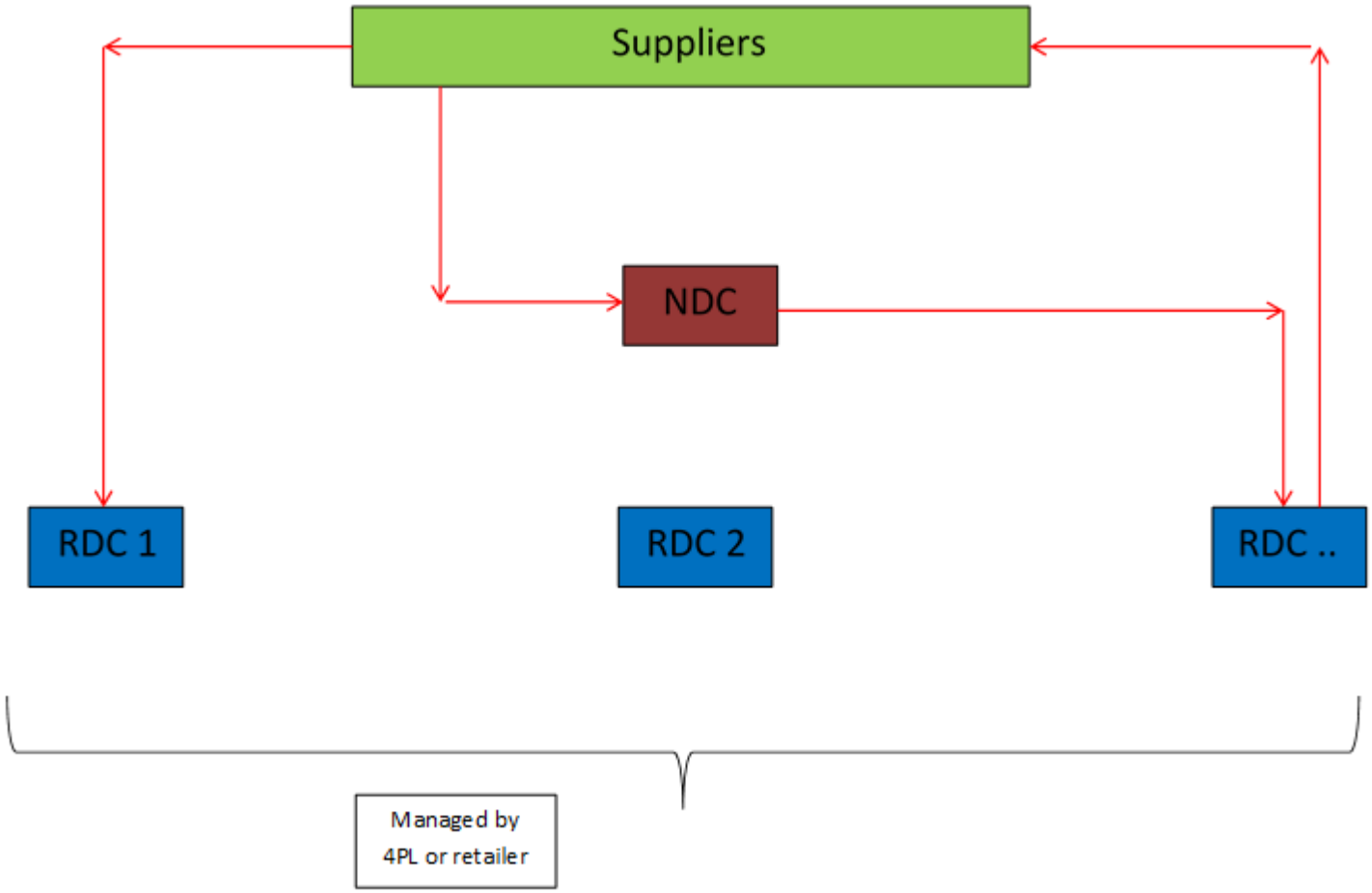

Figure 6 Flow Diagram – Retail Factory Gate Collections

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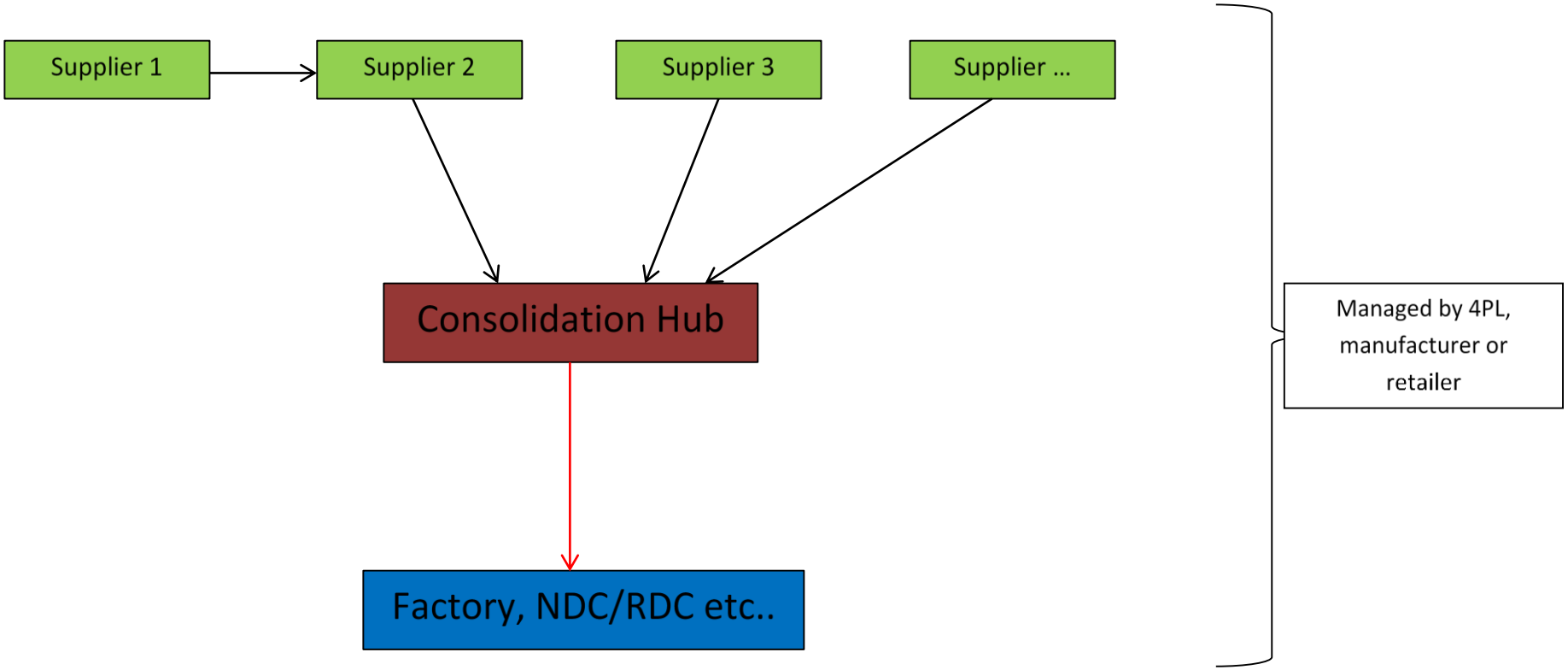

Figure 7 Flow Diagram – Consolidating Supplies

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