Arthur D Little PRISM

Logistics 4.0 – Facing digitalization-driven disruption

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At a time of market transformation, legacy logistics players (LLPs) risk being held back by the weight of their past, with static organizations, old IT systems, and complex processes preventing them from competing. As Logistics 4.0 becomes a reality, how can LLPs set their future strategies and ensure they are focusing on the right areas to become digital champions? This article sets out a potential framework that players can use to manage competing priorities and ensure that investments deliver digital transformation.

In the past, legacy logistics players (LLPs) such as DHL, Kuehne + Nagel, DB Schenker, UPS and Nippon Express operated in a stable world, where efficiency, standardization and low cost were the keys to success. However, digitalization has changed this focus, transforming the market. New, digital-native entrants are better able to adapt to emerging imperatives such as agility, customer centricity and the need to constantly innovate. Legacy players risk being held back by the weight of their past, with static organizations, old IT systems, and complex processes preventing them from competing.

LLPs know they have to adapt, but find it difficult to change directions efficiently and with agility. They have the opportunity to choose from a wide range of technological innovations (from data analytics and drones to crowd sourcing), but can struggle to identify which innovations to adopt and which parts of their business models they should focus on if they are to transform, stay in the game and achieve competitiveness.

With limited resources and time, how should LLPs set their future strategies and ensure they are focusing on the right areas to become digital champions? This article sets out a potential framework they can use to manage competing priorities and ensure that investment delivers digital transformation.

Logistics 4.0: Tomorrow's paradigm

Digital innovation enables logistics players to drive efficiency and lower costs, as well as pursue new business opportunities. This transformation is leading to a new paradigm called "Logistics 4.0," which is based on four key trends:

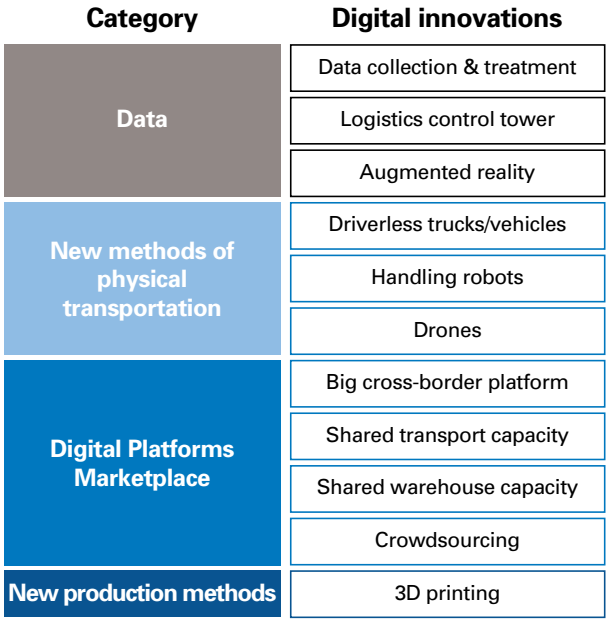


Figure 1: **Logistics 4.0 building blocks**

Data automation and transparency

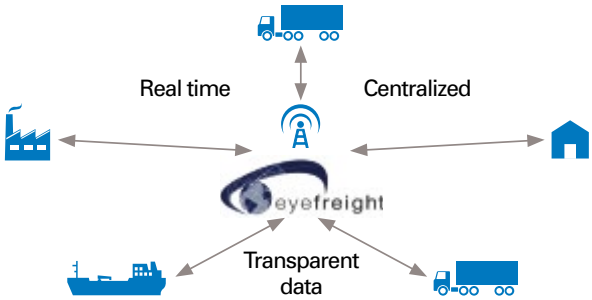
Data has always been at the heart of logistics, and new advances in data collection and analysis offer the opportunity for companies to better meet their goals:

- Strategically, such as by optimizing their route networks
- Tactically, such as by optimizing the number of trucks and drivers required each day
- Operationally, such as by tracking deliveries in real time

LLPs have been working on optimizing these areas for years, and now technology allows increasingly accurate forecasting of requirements (including necessary capacity, personnel time and other operating expenses).

Additionally, real-time, shareable and transparent data provides the ability to introduce new, game-changing technologies such as omniscient control towers (delivering end-to-end visibility over the supply chain), artificial intelligence and augmented reality.

Eyefreight: Logistics control tower



Eyefreight, founded in 2009, with $15 million in equity funding, offers end-to-end visibility over the supply chain. Its clients include Mango, Levi Strauss and Heineken.

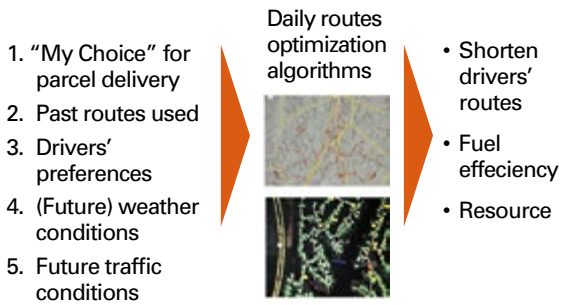
Other companies: Quintic, Infor TM, MP Objects

UbiMax: Vision-picking solution

UbiMax was founded in 2011. It has already deployed its solutions in 100 warehouses across Europe and North America, notably with DHL and Daimler.

Other companies: Vuzix, Augmate

UPS-Orion: Optimization software



UPS ORION software optimizes daily routes for parcel delivery, taking into account end-customer expectations & past-monitored performances. All planned US routes were deployed in 2016.

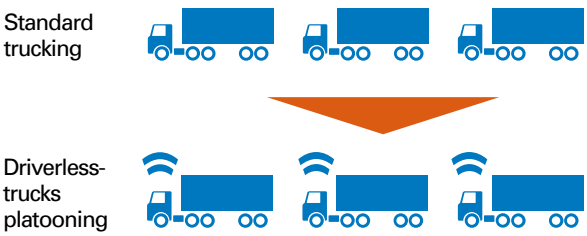
Other companies: Llamasoft

Technology examples in data automation and transparency

2. New methods of physical transportation

Driverless vehicles, handling robots and drones are already in operation and showing financial benefits to the companies that have adopted them. Handling the introduction of these innovations successfully raises new questions around areas such as employment, control and liability.

The European Truck Platooning Challenge



Platooning consists of two or three driverless trucks autonomously driving in convoy and connected via Wi-Fi. The Challenge was initiated in 2016 by the Netherlands during its EU presidency.

Brands: DAF, MAN, Daimler, Iveco, Scania, Volvo

Wynright: Robotic truck unloader (RTU)

Wynright
A Daifuku Webb Company

The very first robot that can fully automate the unloading process of unpalletized products of different shapes and sizes. A single operator can manage 3 RTUs simultaneously.

Other companies: SMB Group, Intelligrated

Eyesee: Inventorying drone

- No goods handling
- Automatic video archiving
- Fewer resources
- More security

The Eyesee drone is the outcome of a three-sided joint venture between Squadron System, Hardis Group, an IT consultancy, and FM Logistic. It was launched in 2015.

Other applications: surveillance, delivery (Domino's)

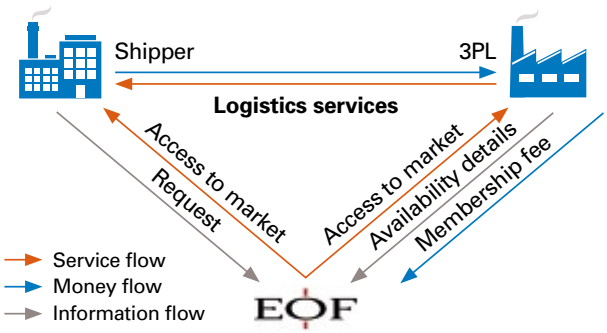
Technology examples of new methods of physical transportation

3. Digital platforms

By enabling the sharing of capital expenses around areas such as warehouses and fleets, digital platforms represent the biggest disruption to the sector, because:

- It enables new, capex-free actors to enter the ecosystem
- It opens up new business-model opportunities
- The platform model leads to a race for size, often resulting in either a "winner-takes-all" model, or at least a very concentrated market
- Crowdsourcing-based business models are still emerging. However, first initiatives, such as DHL MyWays, which enables anyone to carry out last-mile deliveries, open up the sector to new, disruptive models.

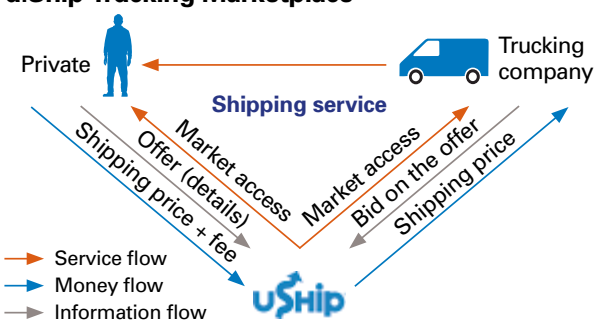
Eyes On Freight: 3PL marketplace



Eyes On Freight is a platform connecting shippers and 3PLs paying membership fees to be referenced. Eyes On Freight has already amassed more than 100 clients.

Other companies: Fleet

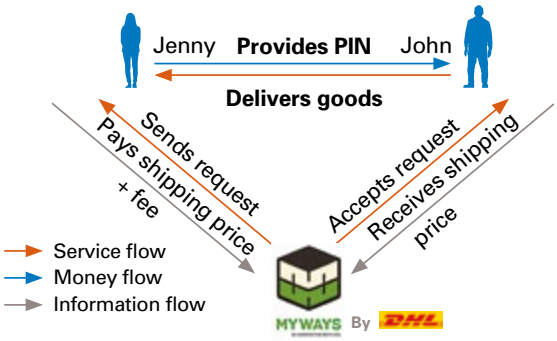
u:Ship Trucking Marketplace



uShip allows truck-owning companies such as DB Schenker to optimize their cost by providing them with an opportunity to maximize their capacity and avoid having empty trucks on the roads.

Other companies: Convoy, CargoX, Coyote Logistics

MyWays: Crowdsourcing delivery



MyWays was launched by DHL in 2013 in Sweden. It allows anyone who does not want to or cannot pick up his parcel to offer money to somebody else, who will accept and deliver the parcel from A to B.

Other initiatives: Checkrobin, Telogis, Streetspotr

Technology examples in digital platforms

4. New production methods

Techniques such 3D printing and additive manufacturing have the potential to change traditional logistics, enabling new, decentralized business models. For example, the need for transportation of specific products could be replaced by on-site 3D printing, in some cases. This creates the opportunity for contract logistics providers to integrate 3D printing services into their offerings, providing last-mile customization.

Shapeways: Bringing 3D Printing to Logistics

PANALPINA on 6 continents + shapeways

Panalpina wants to be able to offer its clients a comprehensive review of its supply chain, to select the product-market combinations that could be 3D printed, and set up the solution.

Other initiatives: La Poste and Sculpteo

Technology example in new production methods

In addition to lagging in digital transformation, LLPs face six challenges to embracing the Logistics 4.0 paradigm:

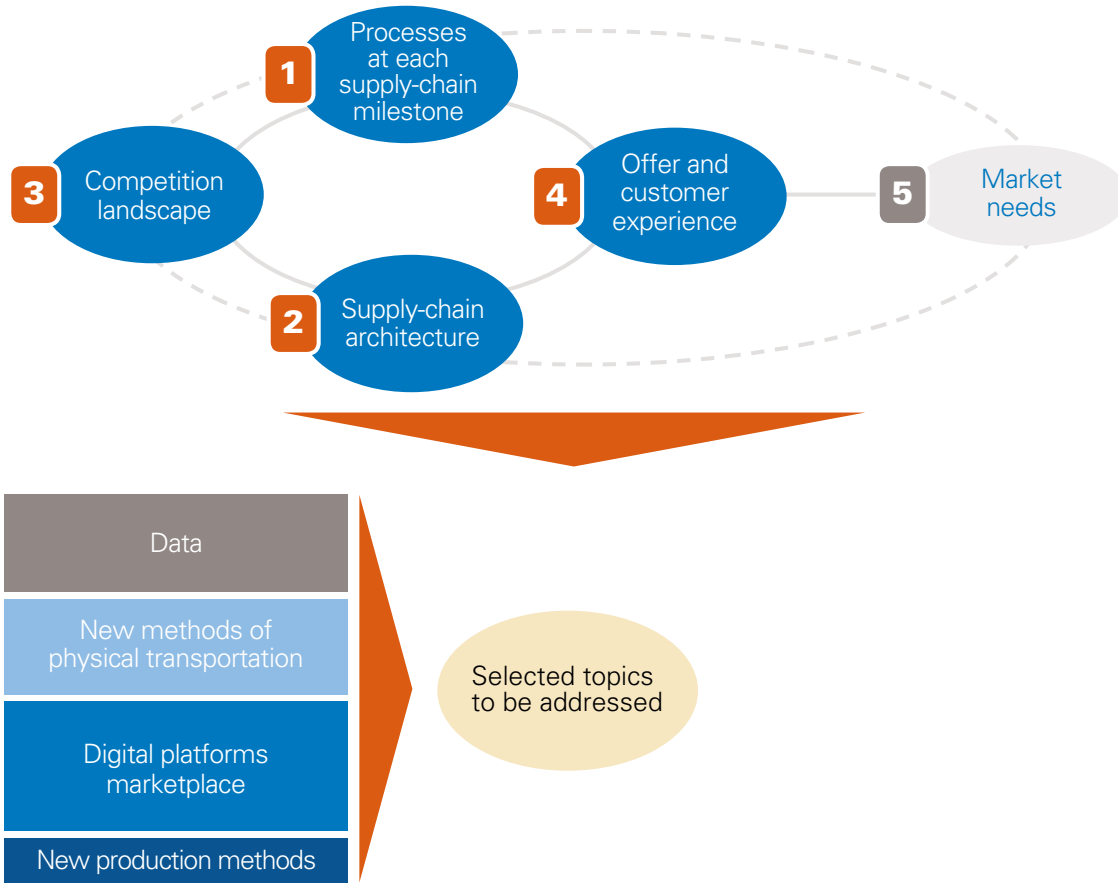
1. They struggle to combine new technologies with their own, outdated system/process frameworks.
2. They are reluctant to adopt new business models.
3. Cash/capex requirements prevent them for making heavy new investments.
4. They find it difficult to manage uncertainties and financial risk.
5. They are not open towards external ecosystems.
6. They do not have structured innovation processes in place.

Currently the logistics landscape is defined by antiquated customer interfaces, a lack of pricing transparency, and asset utilization inefficiencies, with empty ships, trucks, and containers. This means the industry is vulnerable to the disruptive impact of digitalization.

Selecting top priorities

At a strategic level, LLPs have to plan to ensure they are protected from potential threats. But as well as being defensive, this strategy should help them seize the opportunities that digitalization provides.

Understanding the right approach to take begins with analyzing which trends could impact their businesses most. From this LLPs must create shortlists of topics they will have to address, based on the intersection of the building blocks and the impacted areas. These topics might represent threats to their businesses, or could be future opportunities.



Source: Arthur D.

Figure 2: **Selection of topics**

1. **Processes at each supply-chain milestone** will be impacted by Logistics 4.0. For instance, logistics processes will see a significant efficiency increase through automated, connected operations with real-time control, while the standardization of data formats will disrupt forwarding logistics. LLPs will have to deal with difficult investment choices between new enablers (e.g., platforms, driverless trucks, and software), which often require significant capital expenditure and high levels of risk.

2. **The supply-chain architecture will be transformed by digitalization.** For instance, Tier 1 automotive players such as Faurecia are looking at creating self-adaptive supply chains by integrating an end-to-end logistics view. LLPs need to ensure they are not missing the move to digitalization – they need to understand when it is likely to occur and evaluate whether they should drive early change by proactively partnering with different players within the logistics supply chain.

3. **The competitive landscape** is already changing. Although legacy players have a part to play, major disruption is expected to come from new entrants, free of the need to run their existing, low-margin core businesses. New players such as Amazon can more easily develop data compatibility across stakeholders, and have money to invest and no legacy-system burdens. LLPs must therefore step back and rethink their positions in the supply chain. Should they move from being third-party logistics players to fourth-party suppliers? Should they focus on their assets? Should they invest in start-ups, or should they set up their own incubators?

4. Digitalization will enable companies to enrich **their offerings and improve customer experience**. For example, they could offer flexibility in terms of delivery time slots and location, even for non-physical addresses. Every part of the process can have a strong impact on the customer experience. Drones will enhance delivery possibilities and data will offer real-time and transparent information. LLPs should understand which topics they have to address as priorities depending on their businesses, and identify how customer experience can be improved through digitalization.

5. **Market needs** will change with digitalization. Customer activities will evolve, their ability to connect with partners and organize logistics will increase, and even their products could potentially disrupt the logistics chain. For instance, automated cars will make car carriers useless, while different industries will be able to merge their shipments at local levels thanks to transparent data making logistics cheaper. LLPs will need to understand how they can follow these trends, anticipate them and be prepared for disruption.

Picking the right action mode

Once the right topics have been identified, picking the right action mode with which to tackle them is key to allowing LLPs to optimize their chances of transforming potential threats into opportunities. Depending on the individual topic and situation, certain action modes will be much more appropriate than others.

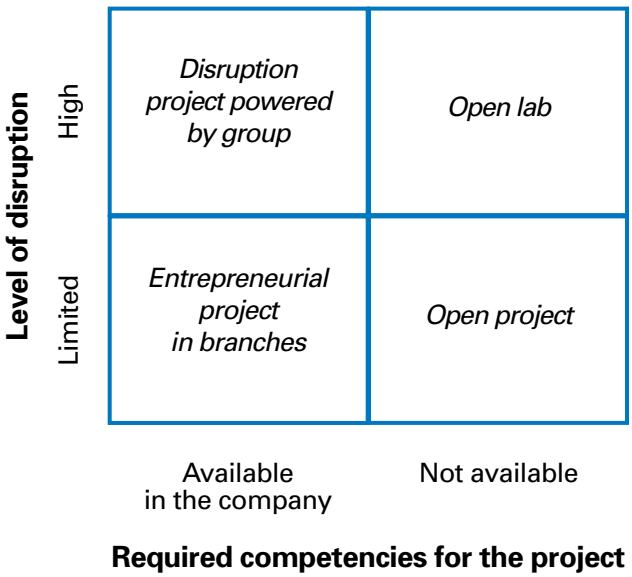


Figure 3: **Action modes**

There are four broad action modes:

Disruption project powered by group function: To tackle major disruption to an LLP, when the company has the relevant skills in-house, an ad-hoc project team should be created, with governance at the group level. This core project team should be dedicated to the task and leverage resources within the organization to ensure that it has all the required skills to solve the issue. This action mode forces top management to consider and assess the strategic issues of the overall company, while keeping full control of the solution in order to turn it into a competitive advantage. The common pitfalls of implementing this mode revolve around organization, such as how to focus senior resources on temporary projects full time, and how to leverage ad hoc resources within the organization without impacting their day-to-day activities.

Entrepreneurial project in branches: in case of limited disruption, when the company has the relevant skills in-house, a specific project should be created at the branch level. There should be a dedicated project manager, while relevant resources within the branch (and the overall support function) provide their expertise to help tackle the issue. This mode ensures that the right action takes place without deflecting the organization from its day-to-day business. As well as organizational issues, the most common pitfall to watch for when implementing this approach is whether the project results can be applied to other branches – the "not-invented/initiated-here" syndrome.

Open Lab: If disruption is expected to be major, but the company hasn't the relevant skills in-house, it should set up an initiative such as an open laboratory. Leveraging external players to acquire either specific knowledge (through JVs or alliances) or non-identified knowledge (through innovation platforms, contests, or user communities) has to be initiated and led by one of the companies involved. This mode enables LLPs to take a wider approach to the topic and tends to generate an optimal solution for the partners involved. Nevertheless, issues around IP management (including what premium the company that initiated the lab receives) are frequent and have to be planned for.

Open project: If disruption is predicted to be small, and the company does not have the relevant skills in-house, an open-project initiative can be set up. Similar to open lab in its philosophy, it is much less resource intensive, but it is more difficult to manage, many players are involved and control of IP becomes a major topic to tackle.

Depending on the context and their cultures, companies could opt for different implementation methods to deliver results: from quick explorations (e.g., three-week sprints) to longer-term projects based on top-down, strategic decisions. For example, Arthur D. Little's "The Breakthrough Factory" is very adaptable to open initiatives, enabling companies to complete them in a limited time (less than one year).

Conclusion

Although the logistics industry is late stepping into digital transformation, Logistics 4.0 is on its way. Radical innovations, new entrants and external factors are about to disrupt the industry in every segment of the logistics chain.

LLPs have to investigate those risks and opportunities, finding the right balance between a top-down, strategic vision and a bottom-up sprint. To do this successfully they need to follow a three-step process:

1. Analyze which trends could impact the business first.
2. Create a shortlist of topics to focus on, based on the building blocks of Logistics 4.0 and these trends.
3. Select the right action mode to tackle each topic.

In every case, LLPs have to pay close attention to the execution of their implementation choices. They will have to focus particularly on the following points:

- Make sure they have deep understanding of the business model set-up
- Be quick, because the competition will not wait
- Correctly assess the risks of arriving late
- Be agile in the choice of their partners

The time has come for LLPs to navigate a tricky transformation, as there is no room for errors in such a capex- and labor-intensive industry. Winners will be those able to turn these coming transformations into opportunities, thanks to the ability to anticipate trends, unleash innovation capabilities and build quick, agile aptitude for transformation.

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