FreightTech
Advancing the future of logistics

FreightTech White Paper 2020

TIMOCOM
AUGMENTED LOGISTICS

Roland Berger

The term FreightTech describes new digital technologies and disruptive ideas that are revolutionizing the logistics industry

FreightTech refers to the application of disruptive ideas in intelligence, automation and integration to increase transparency and efficiency in the logistics industry. These are driven by new digital technologies.

The enabling power behind FreightTech is intelligence – the growing ability to collect and analyze large amounts of data. Hardware-focused applications target increased automation, while software-focused applications target increased integration of the supply-chain. These are not limited to pure logistics. They also cover non-production logistics activities, such as transportation, re-arrangement, transshipment, commissioning and storing of goods, and indirect activities, such as, order processing and supply-chain management.

1

Key developments in FreightTech

In the next 2–5 years, FreightTech is expected to disrupt every step of the traditional logistics value chain. Key to it are new applications in intelligence, automation and integration.

INTELLIGENCE: The complexity and network-based nature of logistics provide myriad opportunities for data-driven decision making and optimization. As such, FreightTech intelligence applications include tools to create, transfer and better analyze data.

AUTOMATION: Increasing productivity combined with the falling price and longer lifespans of robots are driving the growing use of robotic systems in logistics. FreightTech automation applications are thus largely focused on reducing manual tasks.

INTEGRATION: Platform models are increasingly popular in logistics but face the problem of integrating multiple stakeholders. So FreightTech applications here center on increasing transparency and communication between market players by digitizing processes.

Many incumbent players already recognize the importance of FreightTech. Their most visible solutions focus on platform models. In addition, supporting service providers, such as TIMOCOM and others, offer a wide range of solutions to aid digitization.

Venture capital investment in FreightTech start-ups indicates strong investor belief in its disruption potential. The most heavily funded start-ups, as well as most of those in Europe, are focusing on the FreightTech intelligence cluster.

Every step of the current value-chain is open to disruption by FreightTech applications

Examples of potential disruptions along road-freight value chain

1 Shipper asks for door-to-door quote

→ Online tendering
→ Online request
→ Price comparison websites
→ ...

2 Forwarder generates quote

→ Smart matching systems
→ Price transparency software
→ Instant quoting
→ ...

3 Truck driver picks up goods

→ Dynamic routing
→ Autonomous first- and last-mile delivery
→ ...

4 Goods are warehoused

→ Value-chain optimization
→ Just-in-time and just-in-sequence pickup
→ Automated warehousing
→ ...

5 Truck driver transports goods

→ Advanced telematics system, incl. ETA[1] prediction
→ Self-driving trucks, platooning
→ ...

6 Documents are processed

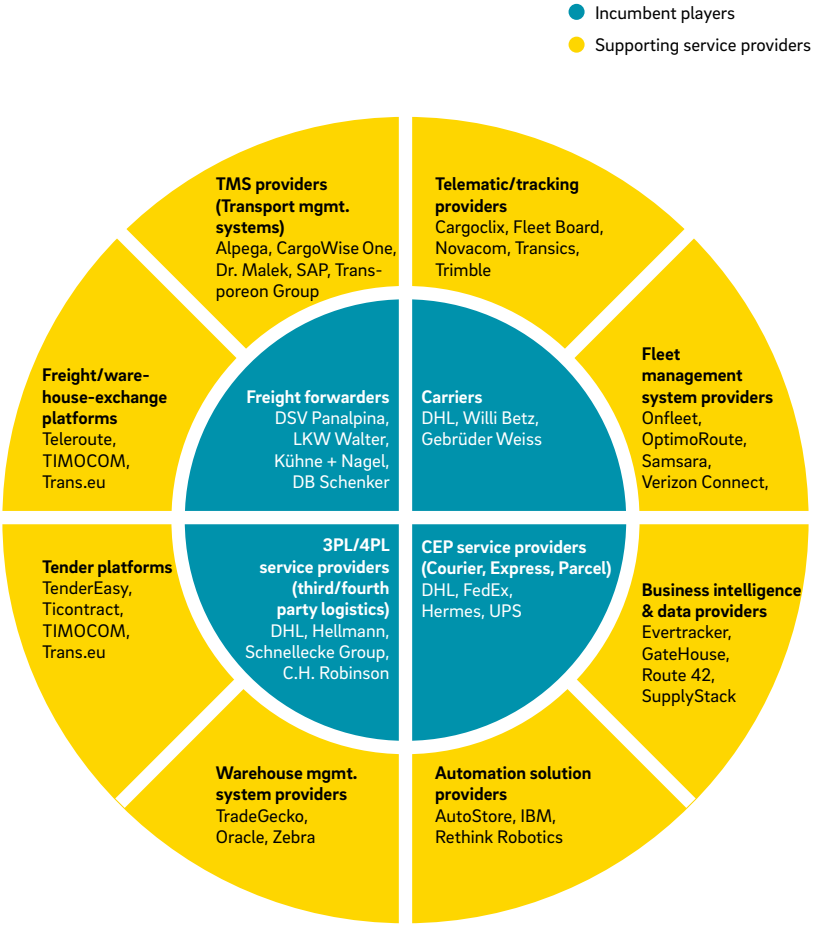
→ Smart contracts
→ e-CMR[2]
→ Value-add financial/ insurance services
→ ...

Source: expert interviews, Roland Berger

1 Estimated time of arrival
2 Digital waybill

Ecosystems, which encompass all companies along the value chain, are at the core of logistics. The FreightTech ecosystem consists of incumbents and supporting service providers

The FreightTech ecosystem[1]



Source: expert interviews, Roland Berger

1 Selection, focusing on road freight in Europe

Several incumbent players already recognize the importance of FreightTech. Their most visible solutions focus on platforms

FreightTech solutions from large logistics players (selection)

DHL

Saloodo!
Saloodo! is a digital freight platform that matches shippers with carriers. It was established by DHL in 2016 and now has 6,000 carriers and 250,000 trucks in 25 countries.

Strategy 2025
DHL's Strategy 2025 includes EUR 2 billion of investment in digital initiatives, such as warehouse automation and robotics.

DB Schenker

Connect 4.0
Established in 2018, DB Schenker's connect 4.0 is an online booking platform for land, air and sea freight.

Drive4Schenker
Drive4Schenker, launched by DB Schenker in 2017, is an online portal for carriers to access road loads in Europe.

Kühne + Nagel

myKN
K&N launched MyKN in 2018. It's a booking platform for air, sea and road freight, offering a one-stop solution for shippers.

K&N Innovation Lab
In 2018, K&N established three innovation centers for digital transformation in Utrecht (NED), Singapore and Johannesburg (SA).

MAERSK

TradeLens
Maersk (51%) and IBM (49%) founded TradeLens in 2018. It offers a neutral blockchain-based supply-chain platform for ocean freight.

MyFinance
Maersk myFinance is an app and web-based e-commerce tool for shippers. It covers online payment, account balance inquiries and cash management.

Source: company websites, Roland Berger

Supporting service providers also offer a range of solutions to promote the digitization of incumbent players and processes

FreightTech solutions from supporting service providers

SHIPPERS

Alpega

Market leader for "on-demand" software and transport management services. Alpega's subsidiary Teleroute, founded in 1985, was the first pan-European online freight exchange for freight forwarders and carriers.

TIMOCOM

A smart logistics system with the leading European market place for shippers (quote request, tenders) and freight forwarders/carriers (spot market, quote request). It is available in 44 markets and 25 languages. Can be integrated in several TMS via APIs.

CARRIERS

Extension of service portfolio towards ...

... **shippers** with acquisition of TMS Transwide (focus on transport execution and connectivity), iNet (internal optimization) and TenderEasy (sourcing and procurement).

... **small/medium-sized carriers** with route planning and calculation tool, online transport order system and GPS tracking systems via integration of telematic providers.

FREIGHT FORWARDERS

CargoWise One

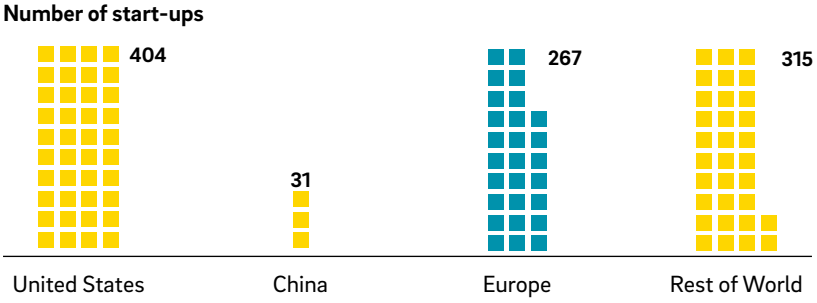
Transport management systems such as CargoWiseOne supply freight forwarders and large carriers with solutions to manage their end-to-end supply-chain. Functionalities typically include: Freight management and procurement, order management, transportation planning and execution, settlement and invoicing, and analytics and reporting.

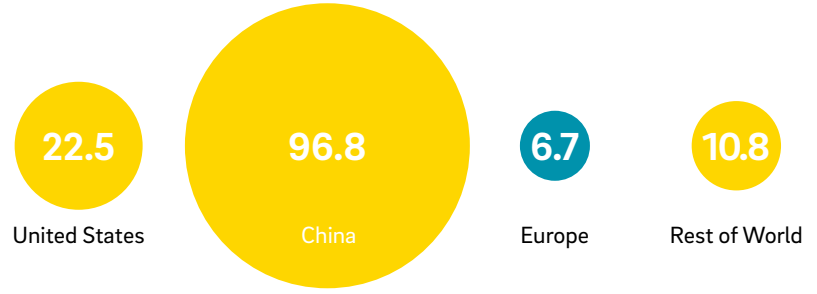
Source: company websites, expert interviews, Roland Berger

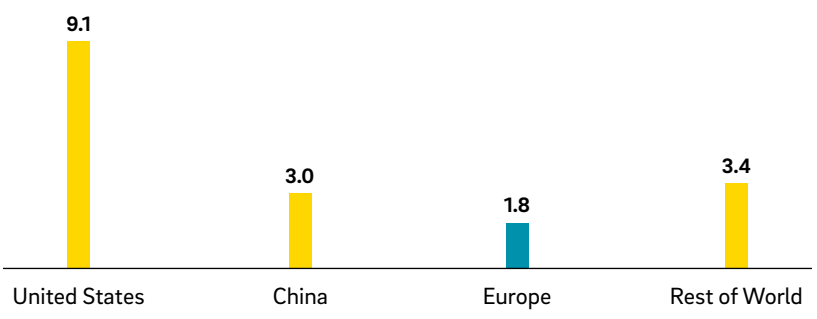
Investors also see the potential of FreightTech. Worldwide VC funding of FreightTech start-ups indicates strong belief in market disruption. US and China lead Europe in funding levels

FreightTech funding and start-up numbers

January 2009 to November 2019



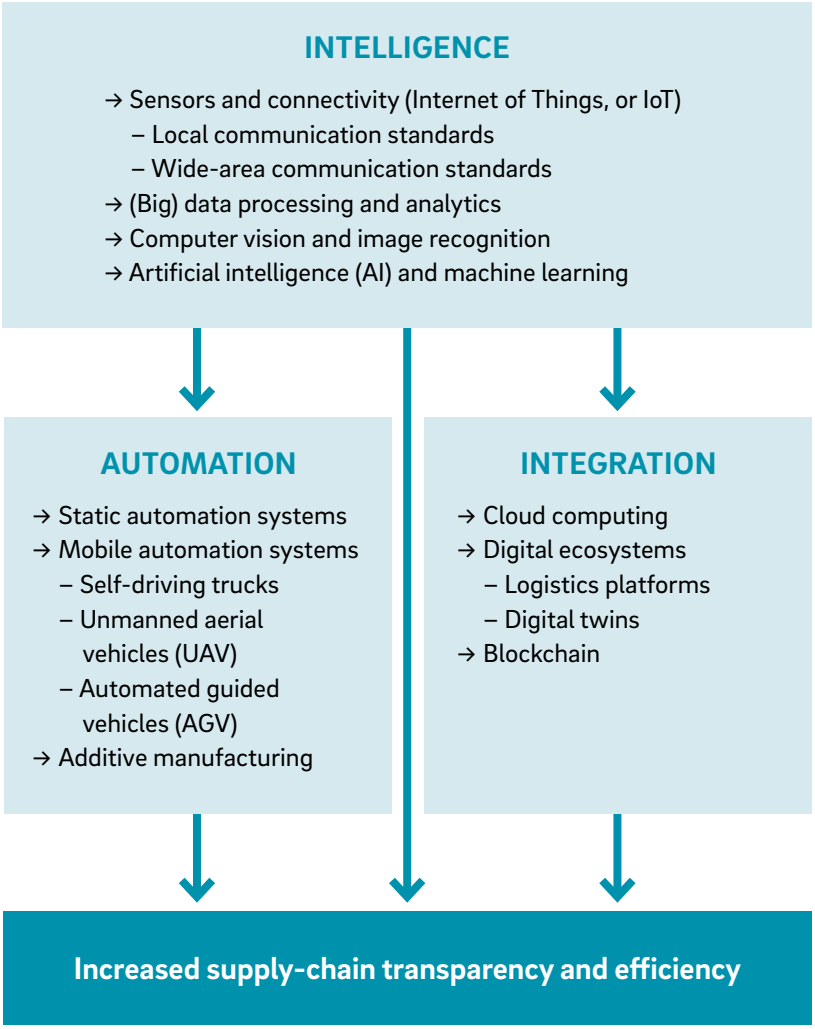




Source: Crunchbase, Roland Berger

FreightTech applications fall into three segments: intelligence enables the automation and integration of logistics processes, improving supply-chain efficiency and transparency

FreightTech segmentation



Source: expert interviews, Roland Berger

Intelligence, automation and integration applications will collectively disrupt the traditional logistics value chain

INTELLIGENCE

Data is now king, and the complexity and network-based nature of logistics offer many opportunities for data-driven decision making and optimization

The network-based nature of logistics and the growing complexity of supply chains mean both can benefit from the use of improved data analyses. Increased supply-chain intelligence also enables the emergence of more data-driven, and ultimately predictive, business models. While artificial intelligence has only a few applications so far in logistics, better data processing is already greatly improving efficiencies at only-slowly digitizing logistics players.

AUTOMATION

Robotic systems are becoming increasingly common in logistics as lifespans grow, prices fall and productivity rises

A cheaper, more flexible and collaborative generation of robots is entering the logistics market, driven by rising labor costs and increasing productivity and lifespans. However, for the next five years, robotic systems will only be able to support employees and not (yet) fully replace their daily tasks. The biggest benefits of robots may be seen in intermodal hubs, where they can more efficiently sort packages according to their destination.

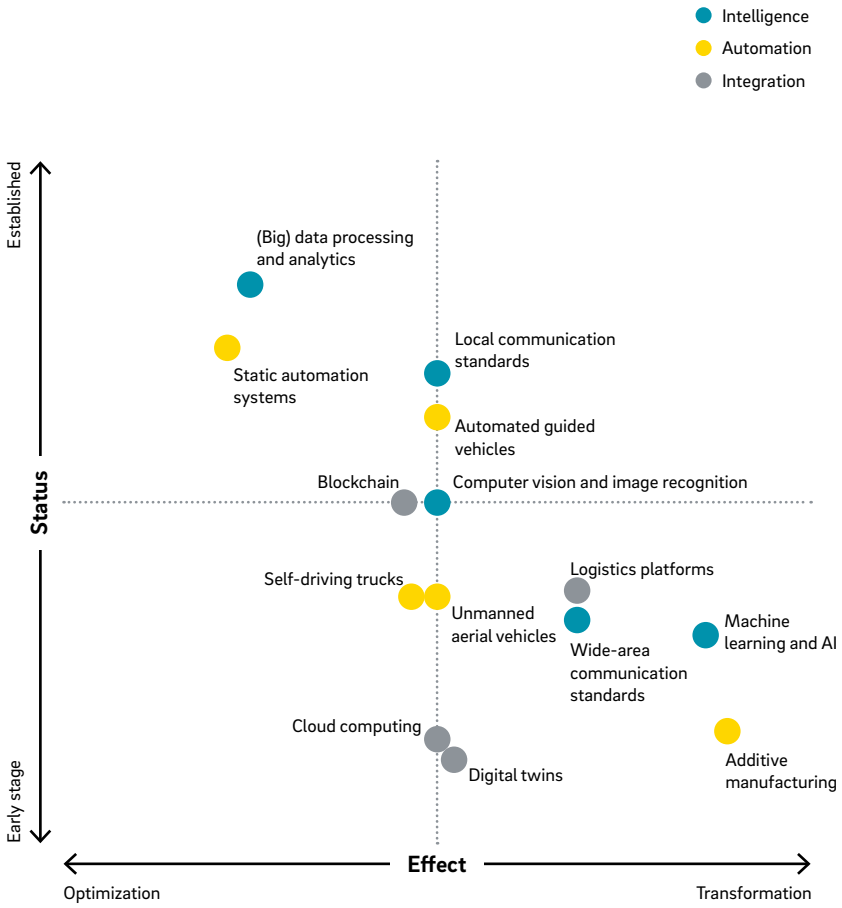
INTEGRATION

Platform models offered by logistics players must fully address the challenge of integrating multiple stakeholders from diverse industries

Several B2C logistics markets have already experienced the rise of platform models. Now, growing connectivity in B2B markets is increasing the need for platform models that improve transparency and efficiency in the overall supply chain. In particular, the European logistics market is still very heterogeneous with no dominant B2C or B2B platform. Compared to B2C, B2B platform business models face additional challenges: they involve multiple industries and parties, lack standardization and suffer from security issues and a lack of trust between market players.

The network-based nature and complexity of logistics markets offer a wide range of opportunities for data-driven "intelligent" decision making, automation and integration

Status and effect of various intelligence, automation and integration applications



Source: expert interviews, Roland Berger

2

Hurdles to implementation

The European logistics market poses unique challenges – it is more fragmented, less standardized and more international than others. Incumbent players face specific hurdles that prevent the scaling of FreightTech, while also lowering entry barriers for disruptors:

1 High investment in digitization, necessary to compete in selected segments with the more agile and efficient solutions of digital freight forwarders.

2 Lack of trust between players in the supply chain over sharing data. This creates the risk of disruptors, such as Amazon, developing one-stop logistics solutions.

3 Carriers, who have the least glamorous logistics role, must deliver data to many stakeholders but do not yet directly benefit from it. Meanwhile, digital freight forwarders and others have found ways to incentivize carriers to provide data.

The upshot is that start-ups and e-commerce players are currently the leading disruptors in logistics. For example, Amazon is transforming into a full-service logistics company, while Alibaba is enhancing its control over the logistics chain of its business.

Due to its fragmentation, the European logistics market faces unique challenges

Key characteristics of the European road-freight market

Economic

The European road-freight market is no "winner-takes-all" market – its structures are highly fragmented. And, in Western Europe in particular, driver shortages are becoming an issue. In Germany, 250,000 truck drivers (~40%) will be leaving the business in the next 10–15 years, creating a shortfall of 150,000.

Regulatory

The diverse mix of governments and policies means it is difficult for logistics services providers to standardize processes across the continent (cabotage rules, lack of European-wide support for a uniform e-CMR format). Also, tachographs, devices that collect driving time, speed and distance, are becoming obligatory for an increasing number of truck classes.

Geographic and cultural

Compared to other more uniform road-freight markets such as the US, Europe has unique practical challenges: diverse languages and cultures; dense road networks; and border controls (outside Schengen).

Source: expert interviews, Roland Berger

Start-ups and e-commerce players are more innovative in addressing the challenges, and are therefore leading disruption in logistics markets – posing a threat to incumbents

The disruptive players

Low — **FreightTech disruption** — High

Start-ups

e.g. Sennder, InstaFreight, Traxens, FreightHub

- Small, innovative players develop market-leading solutions for niche markets within the industry
- Incumbent players with larger, more diversified market shares do not see the small players as threats
- During their growth phase, successful start-ups scale their market penetration and start to threaten the market shares of incumbent players
- Successful start-ups often have superior business models, forcing incumbent market players to either transform their business model or lose their market position

E-commerce players

e.g. Alibaba, Amazon, JD.com, Zalando

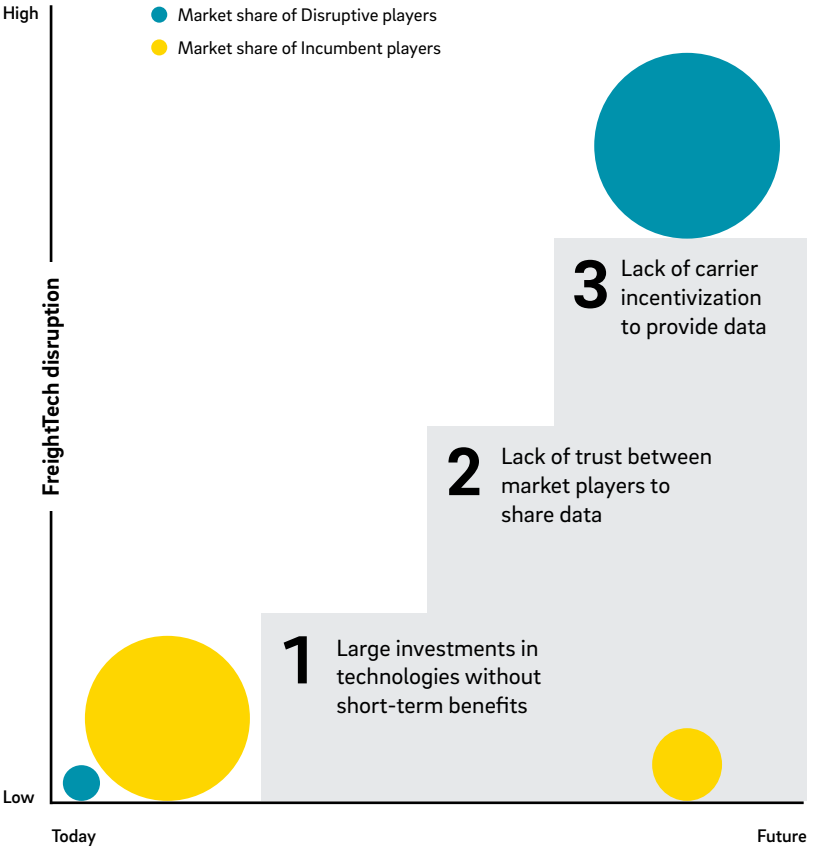
- Large e-commerce players have recognized the optimization potential in logistics, and are investing in logistics infrastructure
- As e-commerce companies, they previously relied on incumbent logistics services providers to carry out their deliveries – internalization of these services increases their market power and cuts costs
- The already strong position and growth of the e-commerce market (B2C) immediately gives major players a large market share in the entire logistics ecosystem
- Once they have established their logistics infrastructure, e-commerce players can diversify their logistics services towards the B2B sector

Source: expert interviews, Roland Berger

Incumbent players face several specific hurdles that prevent the scaling of FreightTech — as well as lower entry barriers for disruptive players

Today, incumbent players are still significantly larger and more established than disruptive players. However, with the increasing market penetration of FreightTech applications and business models, the emergence of hurdles for incumbent players will enable disruptive players to gain market share. As a result, they will slowly outgrow the incumbents.

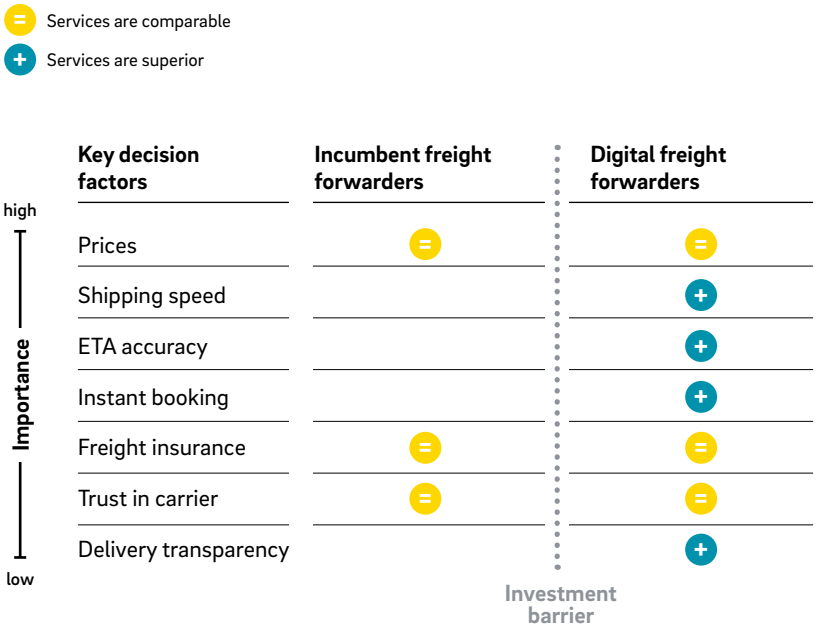
Hurdles for incumbent players



Source: expert interviews, Roland Berger

Digital freight forwarders offer quicker, more efficient solutions in some segments, while high investment levels often hinder incumbents' digitization

Comparison of incumbent and digital freight forwarders



- Incumbent freight forwarders fulfill the basic demands of their customers but lag behind digital freight forwarders in key decision factors in challenged market segments
- Large freight forwarders recognize the danger and are already investing in their transformation
- Smaller freight forwarders lack the funds to adapt their business model
- Consequently, incumbent players who are not able to match the services of digital competitors lose market share

Source: expert interviews, Roland Berger

Although incumbents are slowly digitizing, a lack of trust between players in the supply chain over sharing data allows disruptors to develop one-stop solutions

Hurdles of data sharing

Freight forwarders

3PL/4PL service providers

CEP service providers

Carrier

- → Common access to data is necessary to develop more intelligent, data-driven solutions
- → However, data sovereignty is perceived as a competitive advantage
- → In particular, competitors lack the trust to share data with each other

Threat of one-stop solutions with the ability to combine all steps of the supply chain

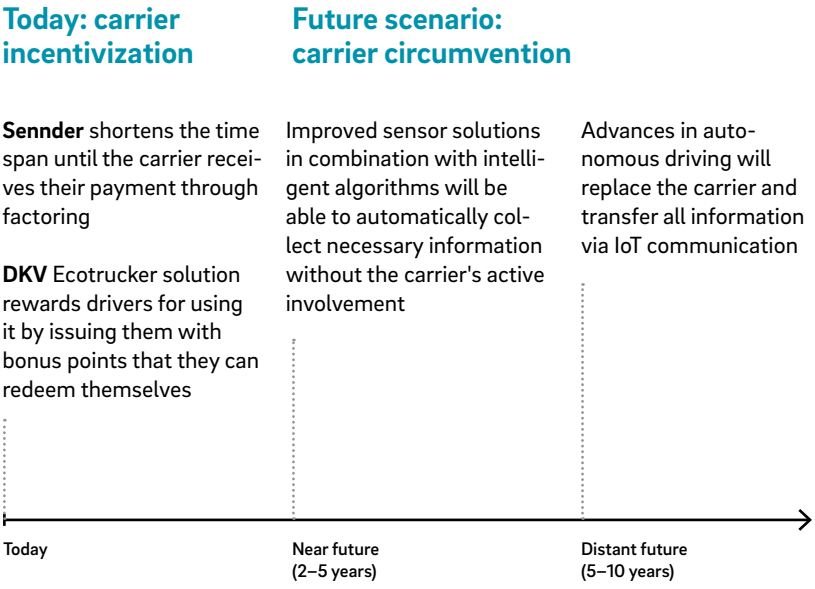
e.g. Alibaba, Amazon, JD.com, Zalando

Source: expert interviews, Roland Berger

Until more advanced solutions are established, carriers do not directly benefit from data generation. Digital freight forwarders and others must therefore find solutions to incentivize carriers

Truck and trailer telematics already capture data from the transport process. However, certain key information still has to be supplied manually by drivers/carriers, for example (un)loading times, driving and rest periods, and changes to ETA (caused by traffic jams etc.). Truck drivers already fulfill one of the least attractive positions in the supply chain due to low margins (mostly commodity business), responsibility for late arrivals, exposure to weather conditions and the physical demands of (un)loading processes.

Solutions to better involve carriers



Source: expert interviews, Roland Berger

3

How incumbents can adapt

The logistics industry, and the way players run their businesses, has fundamentally changed. Ecosystems, consisting of the network of organizations involved in the transportation of goods along the entire supply chain, are now at the core of logistics. In order to fully exploit FreightTech opportunities, incumbent players must understand their ecosystem and adapt current business models to cope with the hurdles and challenges of changing market dynamics.

The logistics industry has fundamentally changed, with a shift away from traditional business models to an ecosystem approach

Different approaches of traditional market participants and ecosystem players

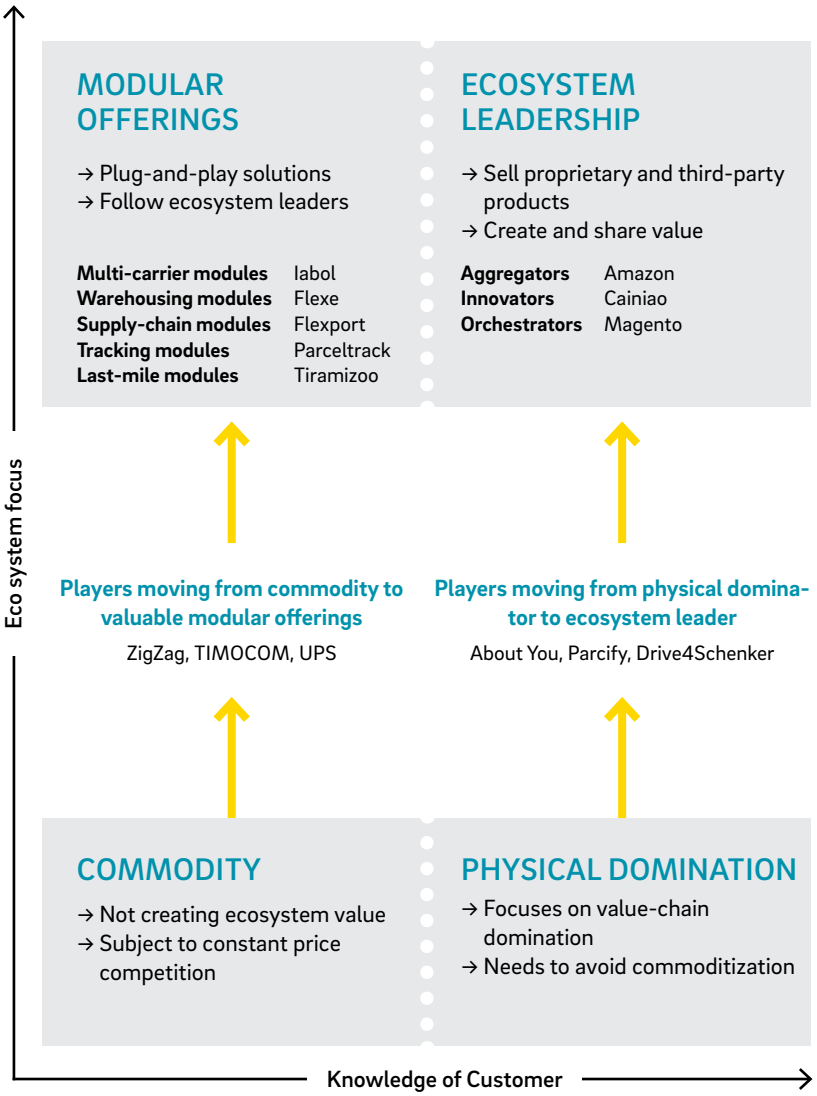
Ecosystems today power 7 of the world's 12 largest companies by market capitalization

Alibaba, Amazon, Apple, Facebook, Google, Microsoft, Tencent

Source: expert interviews, Roland Berger

Logistics organizations have become successful ecosystem players in a commoditized industry, creating value in various ways

Ecosystem strategies and their applications in logistics



Source: company websites, expert interviews, Roland Berger

To successfully exploit FreightTech opportunities, companies must understand their ecosystem and define their value-added

Six key elements to maximize FreightTech value and opportunities

MAXIMIZE VALUE FROM YOUR ECOSYSTEM

1 Leverage relevant ecosystem opportunities

→ Create a clear company vision
→ Extensively analyze your market environment
→ Screen potential ecosystems relevant for reaching your goals

2 Define your own value-added

→ Understand your positioning
→ Create a strategic roadmap
→ Define your ecosystem values

3 Develop eco-system governance, and diversify risks

→ Monitor and re-evaluate your ecosystem
→ Develop internal guidelines and KPIs to manage ecosystems
→ Develop strategies for multiple co-related ecosystems

EXPLOIT FREIGHTTECH OPPORTUNITIES

4 Identify and introduce relevant technologies

→ Identify relevant trends and technologies
→ Focus on fast and flexible innovation projects
→ Reconsider past investments and challenge existing portfolio

5 Create data ownership

→ Generate a constant data analysis to maintain relevance
→ Spread your data sources to as many client touchpoints as possible
→ Secure your intellectual property

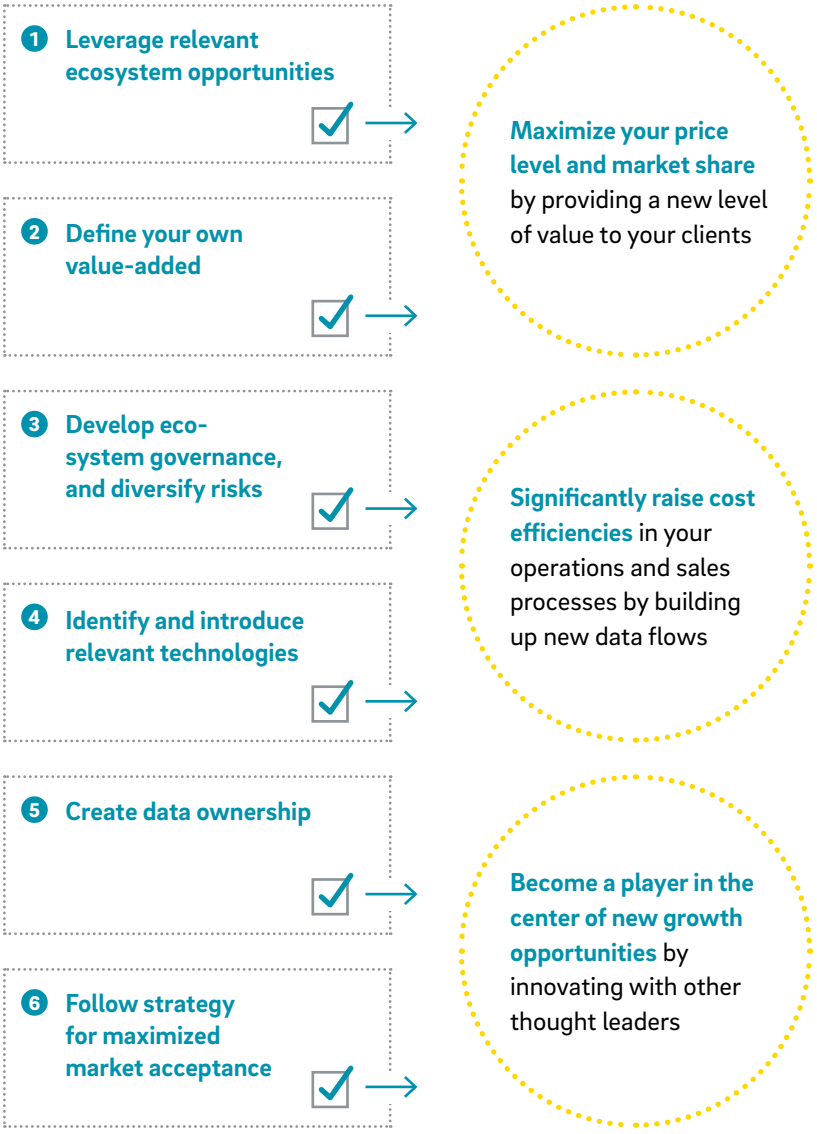
6 Follow strategy for maximized market acceptance

→ Identify hurdles for acceptance of new technologies/services
→ Co-innovate appropriate incentives to address hurdles
→ Push technologies in market and re-evaluate acceptance

Source: expert interviews, Roland Berger

These six key elements work individually, but their effect on logistics businesses grows exponentially if applied as a whole

Can you tick all the boxes?



Source: expert interviews, Roland Berger

4

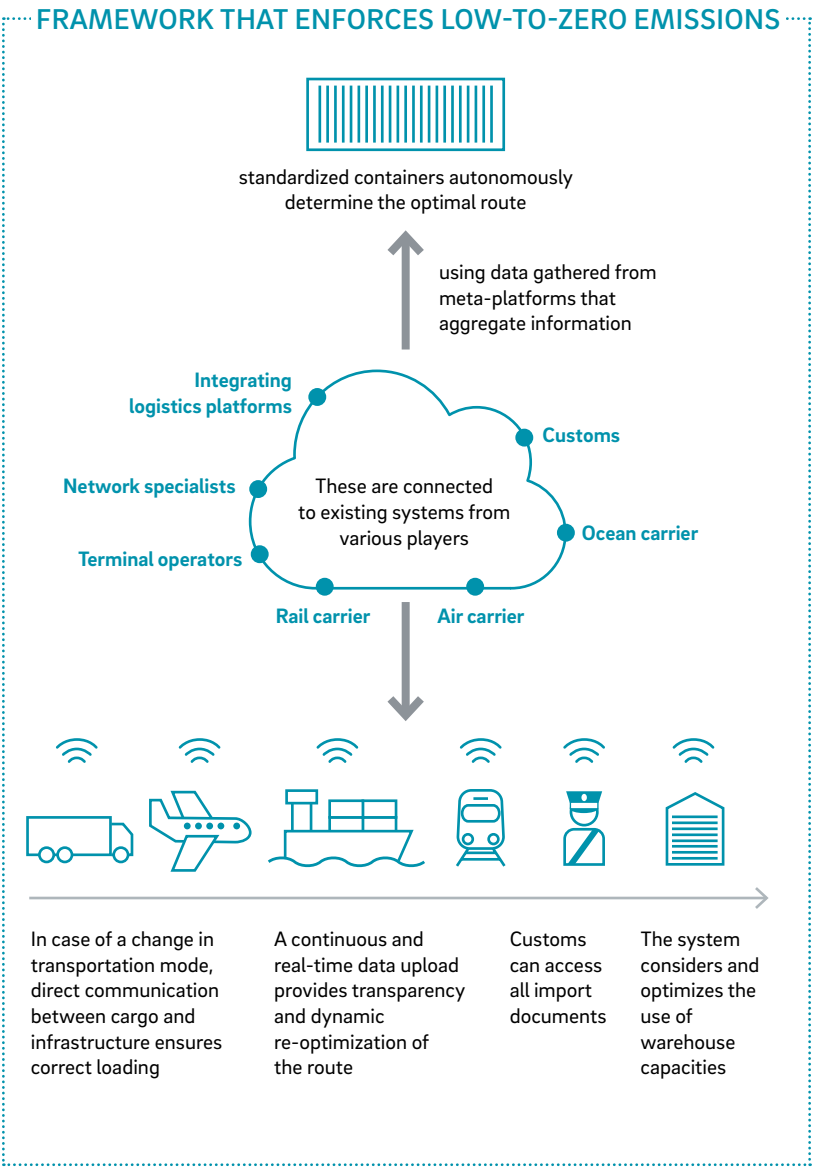
The future of logistics

Beyond 2025, we see an integrated logistics ecosystem where parcels and containers potentially self-optimize their own routing. FreightTech applications in all three segments (intelligence, automation and integration) are key to the shift towards this. Players in this future ecosystem will fall under four main categories: aggregating meta-platforms; integrating logistics platforms; next-generation asset operators; and network specialists. All four roles will compete for the direct customer interface.

Incumbents must decide on their role in the future ecosystem now, as only players who make the right investments today can be leaders of the future.

In the future, parcels and containers will self-optimize their individual routing within an integrated logistics ecosystem

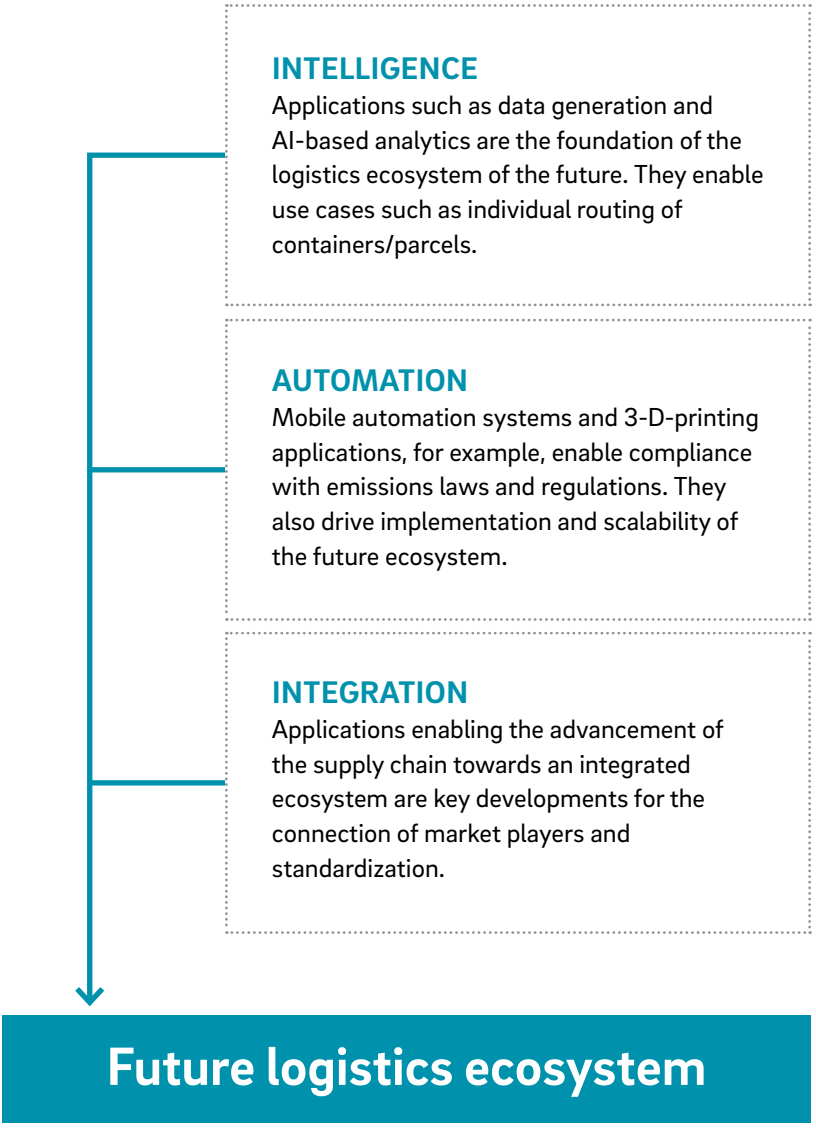
A future logistics ecosystem



Source: expert interviews, Roland Berger

FreightTech applications are key to the integrated logistics systems of tomorrow

The role of FreightTech in the future logistics ecosystem



Source: expert interviews, Roland Berger

Players in the future logistics ecosystem will fit into four main categories, all competing for the direct customer interface

Categories of the future logistics ecosystem

1

AGGREGATING META-PLATFORMS

→ Meta-platforms aggregate information from various sources

→ Enormous market power potential implies existence of several meta-platforms, or co-existence of a few regulated platforms

2

INTEGRATING LOGISTICS PLATFORMS

→ Marketplaces range from add-on offerings to end-to-end "Logistics-as-a-service" solutions

→ Automated matching and optimization

3

NEXT-GENERATION ASSET OPERATORS

→ Digitized and efficient infrastructure operators

→ High degree of analytics, automation and integration capabilities

4

NETWORK SPECIALISTS

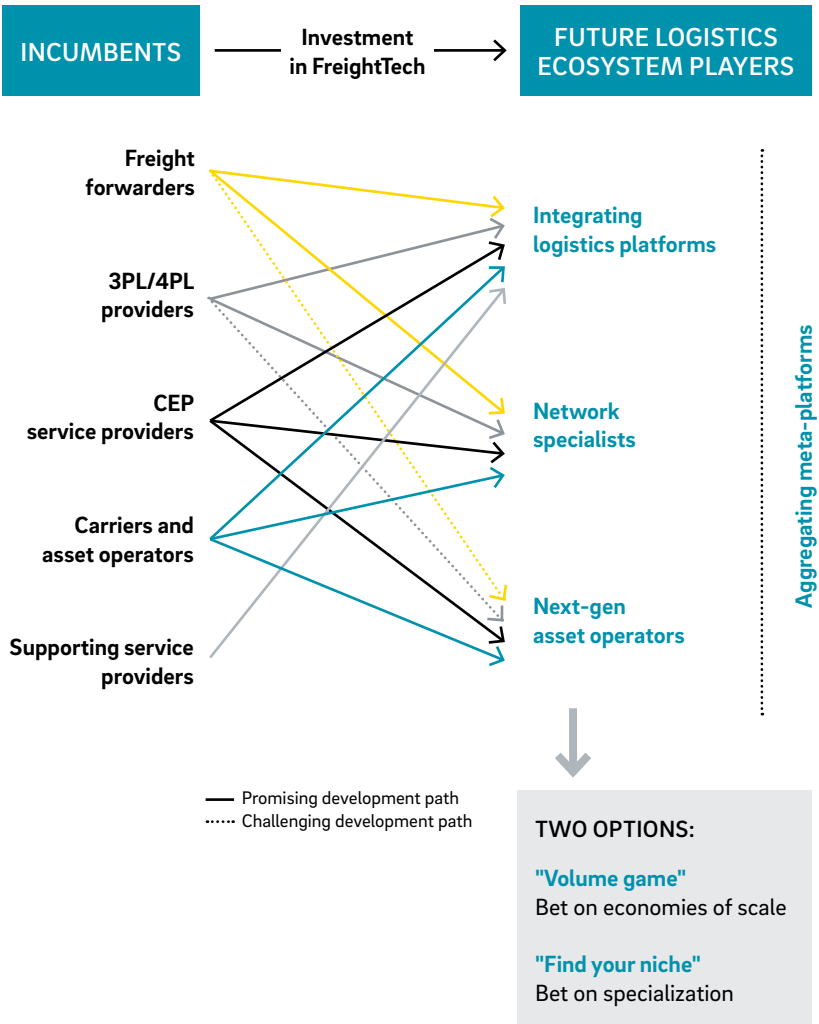
→ Industry or geographically focused network operators

→ High degree of specialization impede replicability for digital platforms

Source: expert interviews, Roland Berger

Incumbents must decide on their role in the future ecosystem – players that make the right investment today will be the ecosystem leaders of the future

Options for incumbent players



Source: expert interviews, Roland Berger


Illustration: 1155678055: undefined/iStock

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Publisher

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RB_SAL_20_002_FLY