



**LOGISTICS
AND FINTECH**



LOGISTICS & FINTECH: FROM DIRECT BENEFITS TO BIG IMPACTS

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This whitepaper is the result of the Logistics & Fintech programme, focusing on exchanging knowledge, promoting interest and creating collaboration opportunities between the fintech and logistics industries. This whitepaper presents our vision of financial innovation for the logistics industry, with best practices and future developments.

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1. INTRODUCTION

FINTECH

Fintech stands for financial technology and encompasses innovation in the financial sector, including innovations in financial literacy and education, retail banking, investments and cryptocurrencies¹. The fintech industry consists of a range of companies; from large and established financial and technology companies to small startup companies. These try to replace or enhance the usage of (part of) the financial services process of incumbent companies by advanced technology solutions².

Entrepreneurs in fintech know the limitations of existing financial processes and are aware of the opportunities of new technologies. They focus on specific financial services and offer innovative digital solutions to the financial industry, or independently offer financial services to consumers or organisations. Fintech offers opportunities for non financial service businesses and often entails ICT solutions building upon smart data gathering and processing. Fintech services may not be well known to the general public, but are already widely used and accepted.



Adyen

Travelling with Uber or booking your room at AirBnB in Amsterdam, your payment is handled by Adyen. Adyen is a Dutch Collecting Payment Service Provider offering 227 different payment methods to global and local operating companies across 4 continents: Europe, South America, North America and Asia.



Voordegroei

Voordegroei is a financing platform that allows investors looking for high-yield investments to fund small and medium enterprises (SMEs) with loans of at least €250,000. After assessment of the SME's business model, earnings and prospects, Voordegroei enables investors to browse through their platform and decide whether to invest in the company.



LOGISTICS

The Netherlands is a worldwide leader in logistics, creating significant added value and employment. In logistics, an extensive chain of companies moves goods from one party to another, requiring information exchange and supply chain coordination. Global developments urge the Dutch sector to continuously innovate in order to remain competitive. Innovation is driven by logistics giants and startups with new perspectives and platforms. Traditionally, innovation used to focus on the optimisation of physical goods flows and information flows. Today, the flow of transaction is recognised as an opportunity to add value in advanced logistics services.

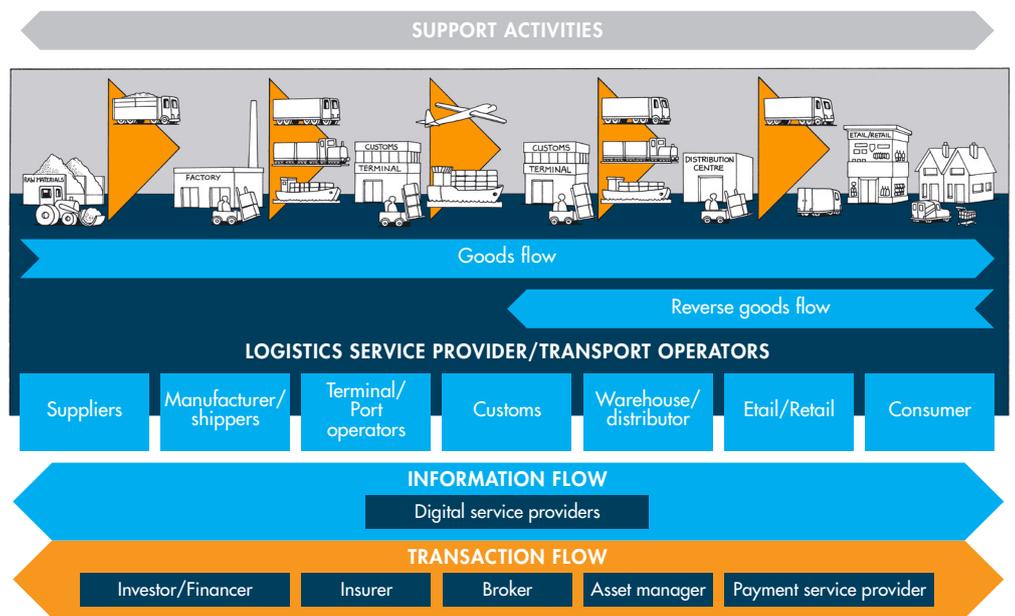


Figure: Logistics actors and flows of goods, information, and transactions

OPPORTUNITIES FOR FINTECH IN LOGISTICS

Within logistics chains, information is often exchanged via paper documents, which involves manual signatures, retyping and stamps (invoice, bill of lading, letter of credit). Many logistics companies still make use of legacy technology systems that lag behind the current state of the networked society. Compared to other industries, logistics services (data and transactions) are not fully aligned with existing digital infrastructures (e.g. cloud software, smart phones etc). This especially holds for small and medium-sized companies.

Using the opportunities offered by fintech, the logistics industry can take a big step forward. However, logistics service providers traditionally focus on the delivery of goods and are not aware of opportunities that fintech can offer to their processes. Both the fintech and logistics industries can reap benefits through joining forces. This white paper is a roadmap for the logistics sector, showing practical examples of fintech services that are relevant to the logistics industry.

2. THREE DOMAINS OF SERVICES AND OPPORTUNITIES

In an earlier exploratory research based on in-depth interviews, we identified three relevant areas in which the combination of fintech and logistics adds value^{III}. There is a significant potential for fintech solutions:

1. To improve administration, working capital & supply chain finance
2. To provide finance for equipment, inventory & real estate
3. To facilitate international business, cross-border movements and trust.

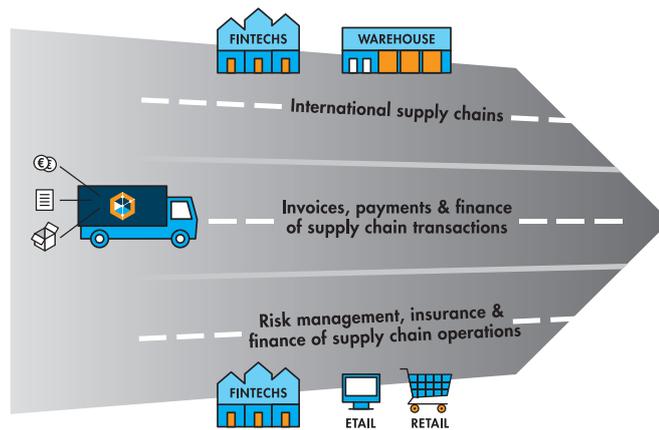


Figure 2: Three domains of fintech services and opportunities for logistics

IMPROVE ADMINISTRATION, WORKING CAPITAL & SUPPLY CHAIN FINANCE

Many logistics companies can reduce their working capital needs using a wide variety of financing options, but many still struggle with their invoicing processes and payment methods. They could gain much by reducing the administrative hassle, improving insight in the financial processes and speeding up payments.

1. Provision of working capital. In some supply chains there are large creditworthy buyers willing to support Supply Chain Finance (SCF) arrangements for financing the net working capital of SME suppliers. In other supply chains, logistics companies can solve their capital needs through other solutions (e.g. reverse factoring), often offered by banks and fintechs.
2. Optimising administrative processes. A broad range of different solutions is available to optimise both purchase-to-pay and order-to-cash processes. Inefficient collaborations between supply chain partners can be improved by enhancing information about delivery for approval processes, invoicing and digital connection between companies.



BEST PRACTICE: LEENBAKKER & COLLECT + GO

Retailer LeenBakker ships its furniture to their customers, using a paper process for their waybills. Collect + Go offers a platform through which logistics companies issue their cargo information and accompanying documents. Truck drivers can directly pick up these documents in the mobile application. The digitisation of the waybills process has saved LeenBakker 5 minutes per docking moment and improved the returns process. The digital proof-of-delivery allows logistics companies to process invoices directly after completion of the job done.^{IV}

PROVIDE FINANCE FOR EQUIPMENT, INVENTORY & REAL ESTATE

The equipment required to fulfil logistics processes is highly specialised and maybe spread around the globe. The need for warehousing and fulfilment also require tailor-made solutions for financing or insurance. Based on more available data about logistics processes, logistics assets and financial and operational risks, fintech service can deliver customer-specific or asset-specific financial arrangements. Two examples:

1. Contextual data to improve and enrich insurance services. Two insurance companies in the Netherlands use the Chipin-technology to monitor the behaviour of drivers and adjust insurance accordingly. Behaviour-based insurance services are not yet available for trucks, although the monitoring technology is used. These would allow transport companies to train their drivers, reduce the costs of accidents (delays, damage to goods), reduce insurance premiums to be paid, and save on fuel.
2. More transparency in the risks of inventory financing. Inventory financing is a line of credit or short-term loan that is useful for businesses that must pay their suppliers in a shorter period of time than it takes them to sell their inventory to their customers. Fintech facilitates the gathering of more accurate data from logistics processes and systems, and allows logistics service providers and specialised financial service providers to reduce the financing risks that the existing financial institutions face.



INNOVATION: DRIVER PERFORMANCE APP FOR INSURANCE OPTIMISATION

TVM is a large co-operative insurance company for logistics entrepreneurs. As part of the Logistics & Fintech programme, Rotterdam School of management students developed a logistics fintech business idea for TVM. The value proposition is delivered through an app that allows truck drivers to track their driving performance based on safety related measures, and encourage them to compete with other drivers to win rewards. Meanwhile, gathered data is used by TVM for improving risk estimations and optimise insurance premiums for their clients.



BEST PRACTICE: ARNOLDUS LOGISTIEK & VOLDAAN

With so many actors and transactions, there are often payment delays throughout the supply chain. Arnoldus Logistiek cannot pre-finance all their invoices and meanwhile secure the work capital for further growth. FactuurVoldaan purchases single invoices from their clients in the SME business sector. For Arnoldus Logistiek, the FactuurVoldaan solution ensures a stable cash flow within the enterprise. ^v

FACILITATE INTERNATIONAL BUSINESS, CROSS-BORDER MOVEMENTS AND TRUST

International supply chains are more complex than regular supply chains due to a larger number of actors involved, unknown and customers, and multiple jurisdictions, tax regimes and customs authorities. Obvious fintech solutions to international trade are the digitisation of documents and connecting physical, operational and financial information. More advanced solutions for the logistics industry can be found in new ways of registering transactions in the logistics transactional webs, e.g. through distributed ledger or blockchain solutions. Also, dual filing in customs supervision might result in higher quality information, less uncertainty at the border, and better cost and time performance for the global logistics chain.



INNOVATION: GLOBAL TRADE DIGITISATION (GTD)

Maersk and IBM developed the first cross-border supply chain solution on blockchain. Global Trade Digitisation (GTD) offers an innovative data pipeline that provides industry-wide supply chain visibility. As a collaboration platform GTD will be open for authorised industry partners, ports and customs. Where supply chain events and documents are shared between these partners through a digital infrastructure and centralised platform, the solution is designed to enhance efficiencies and improve supply chain visibility. This enables a better assessment of supply chain risks and opportunities for risk reduction, and creates opportunities for advanced banking and insurance products. ^{vi}



3. FINTECH AND BUSINESS TRANSFORMATION IN LOGISTICS

In terms of ICT innovation, there is a wide variety in ICT-maturity levels across the logistics industry. The industry is highly fragmented and consists of many different players. There is a lack of standardisation, and in general the industry is not very knowledge driven. How can logistics reap the benefits and potential of the innovative power of fintech companies, given that most companies in the logistics industry have not embraced ICT opportunities?

In the early days of ICT-innovation, Venkatraman ^{vii} developed a model of ICT integration into business. This model distinguishes, degrees of business transformation ranging from small evolutionary changes in which ICT applications are used to improve existing business practices, to situations in which ICT results in revolutionary changes to core business. Placing this model in the context of logistics and fintech, we distinguish three approaches:

1. Fintech application supporting existing business processes.
2. Fintech expanding the service portfolio of logistics service providers.
3. Fintech transforming supply chains.

The first approach is relatively simple, since dependencies are limited and application does not require much knowledge. Combining multiple fintech solutions is more complicated as dependencies increase in their integration, either technologically or financially. This requires more knowledge from the logistics entrepreneur to manage, especially when it entails an expansion of their services and role in the supply chain environment. A high degree of business transformation can disrupt roles and dependencies in the logistics ecosystem.

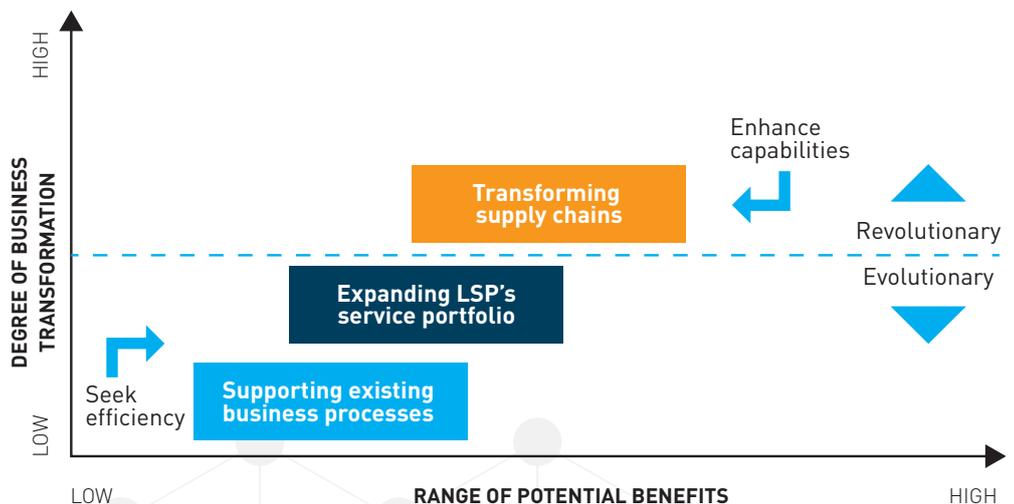


Figure 3: Alternative approaches to logistics innovation by fintech (adapted from Venkatraman)

4. FINTECH SUPPORTING EXISTING BUSINESS OPERATIONS

Logistics service providers face a variety of challenges in financing and managing assets, acquiring working capital, administrative processes and gathering the required operational data. A survey conducted among logistics service providers and additional interviews gives an impression of the most important challenges.

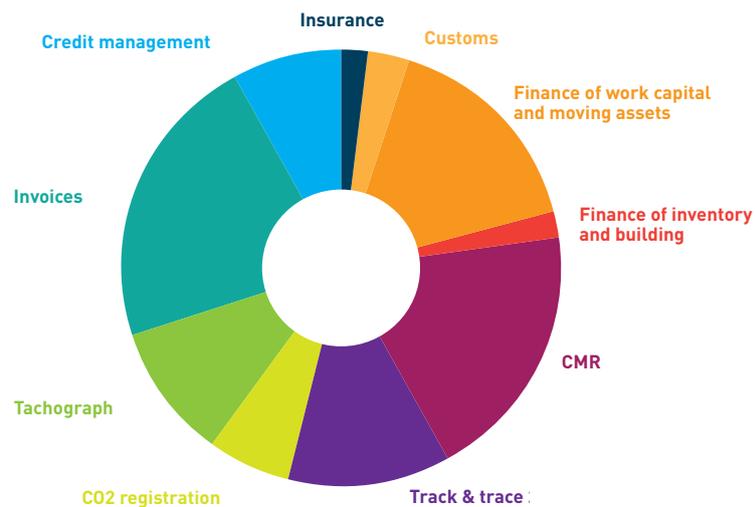


Figure 4: The most important challenges according to logistics service providers

The process of order processing, billing and payments does not always run smoothly and efficiently. Cash flow management is a prominent challenge for logistics service providers. Logistics service providers can enhance their financial position by improving their order-to-cash process. When invoices are accurate and sent out quickly, payments can be received earlier and the costs of financing working capital can be reduced. In addition, an adequate order-to-cash process also requires effective registration and the collection of necessary data in logistics operations (e.g. collecting data from the CMR and tachograph or track & trace data to calculate costs, etc.). Invoicing to the specification of the client or self-billing complicates the order-to-cash process for logistics service providers. As a large part of the order intake is done manually, the new e-CMR is perceived as promising by the interviewees.

Other challenges include the financing of assets, such as buildings, equipment and inventory. Regular financial institutions have introduced more restricted policies and logistics service providers need to find other sources of finance. The respondents also mention challenges in managing their assets such as tracking the process flow of fuel consumption, services and fines on the continuously changing combination of driver-truck-trailer.

WHICH FINTECHS CAN CONTRIBUTE DIRECTLY TO THE PERFORMANCE OF LOGISTICS SERVICE PROVIDERS?

Fintech has many solutions available that improve the processing of orders, invoices and payments, as well as cash management. They have a proven track record in other industries, but up to now have very limited uptake in logistics. The Logistics & Fintech programme has created an overview of fintech solutions readily available in the market. The top 10 challenges have been identified with the use of the research of Windesheim University of Applied Sciences^{VIII} and interviews with logistics service providers in collaboration with 'Transport Logistiek Nederland' (TLN). A few of them already have clients in the logistics and transport sector (see best practices).

1	My invoices are sent late (and therefore paid late)	All invoice information quickly available Collect+Go salesforce
2	It takes a lot of time to manually process my orders and invoices	Tools for automatic processing COMPEND storecove declaree
3	There are disputes about my invoices	Manage the diversity of contracts and invoices Case Information Systems, Inc. ControlPay cm-icct
4	I need working capital for payments	Pre-financing of your invoices Debiteuren > beurs FACTURIS CLOUD9
5	I need working capital for growth	Real time insight for potential investors SPARKHOLDER
6	My customers pay too late or not at all	Increase the power of your debtors management BUCKYROO
7	I have an unexpected shortage of cash for payments	More insight with cash flow management tools CashRocket BLUE ROCK DUNNING
8	The pay moral of new customers is unclear	More certainty with online credit checks GRAYDON dun & bradstreet
9	Charters want to be paid soon	Quick payments with the use of an external financier BOZT24 voldaan CF
10	I need capital for investments in trucks or space	Online platforms for financing NPEX symbid VOOR DE GROEI

Figure 5: Top 10 challenges of logistics service providers and fintech solutions

So far the adoption of these fintech solutions in the logistics industry is low. The challenge is to make logistics service providers aware, especially small and medium sized logistics companies, as well as their advisors. A further challenge is to solve a potential conflict of interest that may arise with existing finance providers. They may not favour the shift of part of business financing to other companies, as they may perceive this as reducing their profit margins and increasing their risk. However, large financial institutions should allow entrance to small fintechs to the SME market. The SME market is a difficult market for large financial institutes, since costs are high compared to finance volume. Small fintechs with low overheads and flexible ICT solutions can serve this market, either through partnering with banks or working alone. The three Dutch banks ABN AMRO, ING and Rabobank showed interest in collaborating with fintechs.



BEST PRACTICE: RAAB KARCHER & BUCKAROO

Raab Karcher is a specialist in building products and services. Besides their B2B business, consumers can also order their materials through a website. Raab Karcher faced problems due to an inefficient invoicing process of invoicing their suppliers. Buckaroo is a payment service provider offering payment gateways, subscription services and credit management for online merchants and corporates. Buckaroo offered Raab Karcher an automated subscription system with direct debit. This provides Raab Karcher with a fast, automated, and reliable invoicing procedure, and thus more stability in their cash flow. ^{ix}



BEST PRACTICE: EARTH WATER & BOOZT24

EARTH Water delivers drinking water, donating their profit to charity to alleviate water shortages in the world. The company issued packing slips manually, resulting in the late invoicing of their clients. Boozt24 finances working capital based on existing business and client relationships. Boozt24 automated a relevant part of EARTH Water's invoicing process. When the factory generates the packing slip, an invoice is directly created through Boozt24's platform and sent to the client. This process cuts administration costs and decreases the risk of invoice errors. ^x



BEST PRACTICE: SCHENKER LOGISTICS & DECLAREE

Schenker Logistics Netherlands has approximately 600 employees on the road daily. They submit their receipts on paper when they come to the office. These are processed manually by their manager and the financial administration. Declaree offers an expense management software solution with a smartphone application digitising expenses on the go. Expenses are approved online and automatically registered in the financial administration. This way, Schenker is saving handling time and costs as well as being more compliant with fiscal rulings. ^{xi}

5. FINTECH EXPANDING THE SERVICE PORTFOLIO OF LOGISTICS SERVICE PROVIDERS

In the financial sector, fintechs have truly challenged the position of large financial institutions. The emerging companies generally do not attack incumbent players head-on, but rather focus on tackling specific services. In 2014, CBInsights presented a first overview of 50 fintechs that were unbundling the bank with improved and focused services.^{XII} Since then, the large financial institutions have responded by initiating their own internal startups or seeking collaboration with fintechs.^{XIII, XIV} Banks are also offering new services for small and medium sized enterprises at lower cost.

This same trend of technology startups attempting to unbundle large incumbent players is also visible in the logistics sector. Similar to the financial sector, technology startups focus on specific logistics processes and services, like tracking & tracing, tariff comparison, scheduling pick-up, booking air/ocean transport, etc. The overview of 'Unbundling FedEx' presented by CBInsights (see figure below) provides a clear example of the variety of technology startups that has emerged.

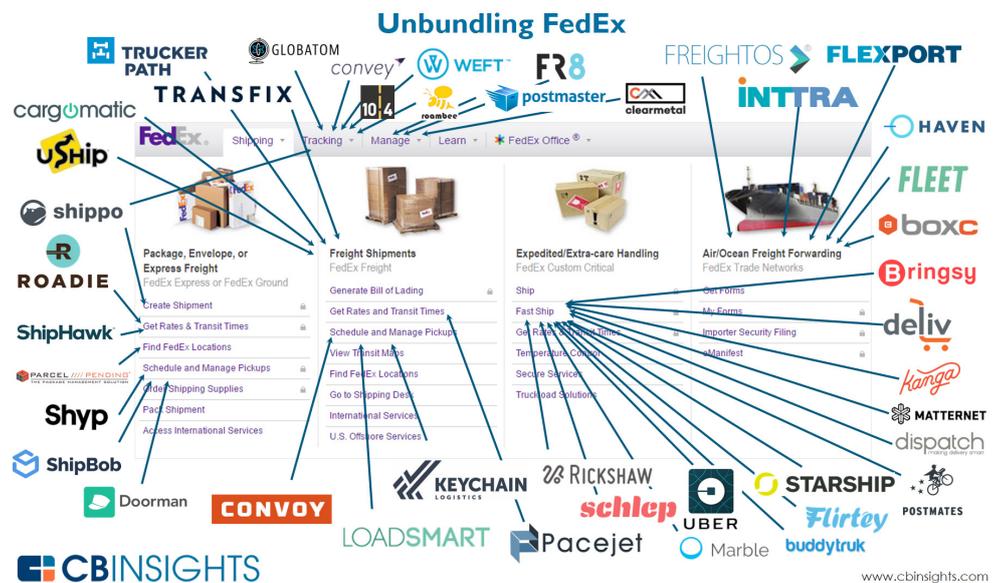


Figure 6: Unbundling FedEx (CBInsights)

Similar to the banking world, large logistic service providers (LSPs) can respond by strategically collaborating with new startups to provide a better proposition to their customers. Technology will not change the fact that LSPs are responsible for handling and transporting cargo. Technology will, however, give LSPs choices in terms of how much control they want to have over the logistics processes of their clients. More control would give more responsibility, but also better margins. Less control could mean less burden, but when LSPs take a back seat to managing logistics functions, they may be opening the front door for shippers to take over these functions themselves.^{XV}

Fintech offers opportunities for logistics service providers to expand their service portfolio in shared services. ^{XVI} They can expand their role in the supply chain and add value to their customers by reducing risks and costs. Logistics service providers have insight in real time, reliable supply chain data, providing them with the commercial opportunities for developing new services, aided by fintech. These services could incrementally change the role in the supply chain by adding to their service portfolio, or could create entirely new business models. Furthermore, partnering with logistics service providers and extending their business portfolio allows fintechs to gain access to customers in the logistics chain. As the awareness of the opportunities of fintech in the logistics industry is still limited, a partnership approach may accelerate the process of new business for fintechs as well.

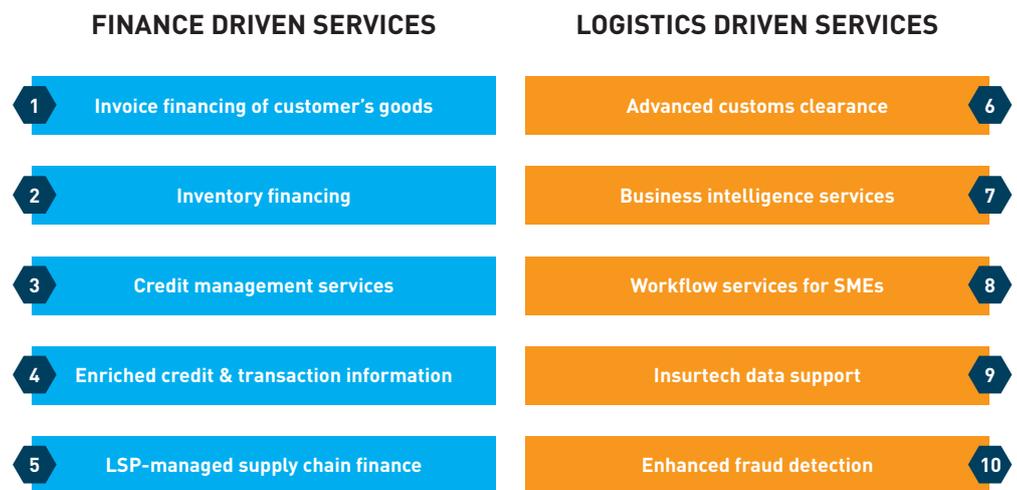


Figure 7: Services expanding the portfolio of logistics service providers

EXPLANATION OF PROSPECTIVE SERVICES

1. Invoice financing. Invoicing financing is normally offered by fintechs to manufacturers and trading companies. However, an LSP can partner with a fintech to offer its customers financing of the invoices of the goods delivered by the LSP. The LSP has control over the delivery process and can provide data on proof of delivery to the fintech. LSPs operating (in) national distribution networks that have access to a large number of SME customers are attractive to team with fintechs.
2. Inventory financing. An LSP can offer financing of inventory to its customers when this inventory is stored in the LSP's warehouse. The LSP has the most reliable data on the inventory levels and mutations, and has retention rights on the inventory. The transparency and retention rights reduce the risks of financial institutions financing the inventory via an LSP, instead of the owner of the goods. ^{XVII}
3. Credit management services. Some logistics service providers do not just deliver the physical shipment to consignees, but also deliver invoices and dunning letters digitally and physically. This service can be extended to full credit management by monitoring the entire invoicing and payment process, and taking action when necessary. This is helpful for foreign based shippers that do not have a presence in the country of destination.

4. Enhanced credit & transaction information management. In the context of for example e-commerce, which is characterised by a proliferation of small (sometimes micro) enterprises, LSPs often oversee the only information available on the actual performance of small actors: delivery performances, volumes, and sometimes even invoices. The financial industry, however, is always looking for additional information that can enrich the standard credit rating. A partnership with a fintech company offering data analytics (e.g. big data) can unlock value added operative information. This can provide such small and micro enterprises with a financial rating and the possibility to access cash from external financiers.
5. LSP-managed supply chain finance. Full working capital financing is rapidly gaining the attention of companies and financiers. In manufacturing supply chains with strong, large buyers (such as automotive), orders can reliably be traced back to several tiers of supply. This means that innovative fintech companies could finance tiers of supply by retaining the ownership of the goods flows throughout the supply chain, providing suppliers with the goods, and paying them only for their value added. However, they will need to partner up with an LSP that can keep a stronghold on the product and information flow, providing traceability, quality check and reliability throughout the tiers of supply.
6. Advanced customs clearance. In cross-border e-commerce transactions, the enormous volume of low value shipments makes it almost impossible for customs and customs brokers to check compliance for each individual shipment without the original invoice and reliable data on the payment of invoice. Fintechs, customs brokers and customs can offer web shops platforms and advanced customs clearance services, making sure that invoices and payments can be checked automatically.
7. Business intelligence services. LSPs and fintechs collect a lot of data on customer orders and deliveries. They can use this information to support shippers in optimising their delivery strategies. Especially in the B2C markets, information on the success rate of attended home deliveries can make consumers at the checkout of a web shop aware that an alternative solution (e.g. unattended delivery at a pick-up point) provides more comfort to the customer and generates less costs for both shipper and logistics service provider. Example: Transsmart.
8. Workflow services for SMEs. SMEs, especially in cross-border transactions, usually face difficulties in managing their procure-to-pay (P2P) and order-to-cash (O2C) processes. Sending invoices, exchanging documents, checking credit ratings are burdensome activities for small companies. They lack proper resources, training, and access to information, and face relatively higher costs due to smaller economies of scale. For this reason, several fintechs already provide automated workflow management services to SMEs. Logistics companies, however, are playing their role as well. Large LSPs already take over operative procurement tasks or invoicing processes from their customers, exploiting the synergy with standard inbound logistics operations. Fintechs and LSPs will increasingly converge to offer more comprehensive workflow solutions to their customers. Example: Simon Hegele.
9. Insurtech data support. A partnership between an LSP and a fintech provides higher visibility of operations, and increases the availability of data on the conditions of shipments to a shipper. These services support a shipper in avoiding and managing risks in logistics operations. The focus is not just to generate lower insurance claims, but to create more reliable and safer supply chains. Examples of start-ups that can link with LSPs are: Cargosnap, Validaide.



10. Enhanced fraud detection. As supply chains grow more complex every day, asset-based fraud and theft becomes more and more common, making financing assets riskier. New technology (e.g. IoT or blockchain) can provide greater transparency and traceability of assets throughout the supply chain. A product digitised on the blockchain can be easily traced at any given moment with high reliability, providing corporates and financiers with sensible information on location, status and origin of goods. LSPs are in the right position to provide to their customer (through a partnership with a fintech) such visibility, and provide more fraud-secured supply chain services.

The overview we present in this chapter refers to prospective services. This means that the basic services and technologies are readily available, but LSPs and fintechs must begin collaborating to develop new services that combine their strengths.



CARGOSNAP

CargoSnap is a mobile and cloud environment that provides image storing and sharing. Logistics professionals can improve their operations, reduce risks and provide supply chain partners more insight into their operation. LSPs can provide their customers and suppliers secure access to the visual information of individual shipments and proof of condition in case of damages.



VALIDAIDE

Validaide supports the logistics industry with innovative solutions for supplier qualification and lane risk assessments. Selecting qualified suppliers is critical for the transportation of pharmaceutical, perishable and high-value products. With the Validaide platform, LSPs exploit their data in an electronic workflow to standardise and improve supplier qualification.

6. FINTECH TRANSFORMING SUPPLY CHAINS

A challenging question is to what extent fintech can bring a real breakthrough or transformation in supply chains that is needed to solve the problems of lack of transparency, inefficient use of capacity and reluctance to cooperate by supply chain partners. Fintechs have as large a potential in transforming logistics businesses as they did in the financial world. Large financial institutions are more and more challenged by fintechs that offer better services and at lower costs to their customers: various mobile apps that support payment, emergent internet banks that have no offices, and so on. There are several transformations that fintechs may trigger in supply chains.

TRANSFORMATION OF INTERNATIONAL TRADE AND LOGISTICS

In the cross-border movement of goods, many supply chain actors are involved, all with their own interests: shippers, forwarders, carriers, agents and customs and inspection agencies. All of these need and produce data and information. Furthermore, goods do not move without finance, guarantees and insurance. Effective risk management is difficult for authorities as data does not come from the source and the owner of the goods is often not visible at the moment of border crossing. This may result in more government inspections and increased cost in cross-border trade.

With the long supply chains and many actors, data and transactions as well as different jurisdictions and currencies, international trade and logistics faces many challenges.

- Lack of reliability and transparency of supply chains for shippers
- Existing business models based on lack of transparency in (parts of) the logistics industry
- Reluctance to engage in sharing and re-using data
- Focus on reducing costs versus adding value
- Tendency to shifting the blame for mistakes to supply chain actors like customs
- Mutual acceptance of irregularities (or inability to solve these)

Over the years, various initiatives have aimed to improve transparency in supply chains and to develop a data pipeline to allow each part of the chain to optimise its processes. However, the actors in the transport chain are insufficiently willing and able to cooperate to design and implement end-to-end supply chain solutions.

Meanwhile in trade finance, companies like TransDocLink and Third provide services that reduce the costs and complexity of international trade transactions between suppliers and customers. Their solutions focus on the simplification and acceleration of the administrative process in finance and guarantees (letter of credit). To gather service delivery information in order to determine the right payment schedule, these fintechs are increasingly seeking and integrating supply chain data regarding shipment progress. In this way, they provide shippers with accurate information on their supply chain.



TransDocLink

TRANSDOCLINK

TransDocLink is a payment institution delivering on-line trade support and financial settlement for small and medium enterprises. TransDocLink streamlines the cross-border payments and document handling providing transparency, cost efficiency, risk minimisation and ease of use in international trade transactions.



THIRD

Third offers transaction settlements for letters of credit, and also handles other types of transactions for which the parties involved have made agreements about triggers when payments are released. In addition, Third offers a solution for companies that have to settle many transactions within their own business. With Third's platform, it is no longer necessary to have all these transactions proceed through the banking system (with all costs). The Third platform registers all mutual transactions and consolidates all payments to settle differences with a single transaction.

Providing supply chain visibility to shippers and linking progress to payments of goods and logistics services can transform the logistics industry. Currently, international logistics chains are a black box to shippers: in supply chains, many irregularities or intended optimisations by logistics service providers result in consequences for the shipper or the forwarder acting on his behalf. But the shipper cannot influence this due to a lack of information or verification of the cause of the delay or change. In many cases, shippers do not even know which operators are carrying or handling their goods.



Figure 8: Challenges in international trade and logistics

Fintechs can offer more visibility and a grip on the supply chain to shippers if they not only enable and support the processing of goods transactions and payments, but also the transport contracts for these shipments. Issuing a letter of credit includes financial agreements requiring the identification of the actor and milestones in the chain beforehand to enable swift payment upon service delivery. An approach in which milestones and payments are also applied to the transport contracts of the goods transaction provides more control on the supply chain by shippers. If the payments can be transferred directly to the various contractors, this will contribute to working capital optimisation.

At one of the roundtable discussions held in the Logistics & Fintech programme, the logistics industries urged the fintechs to bring business transformation to the logistics sector. It is, however, not fair to expect fintech, a young industry itself, to revolutionise logistics on short notice. This is a challenge that the logistics industry itself has not been able to accomplish

over decades (since the introduction of the standard container). Most fintechs have originated from the financial industry itself and offer solutions to problems that other, more established financial institutes let pass. This implies that fintech suppliers need logistics experts to jointly develop solutions for existing issues and opportunities in the current business context, and then slowly start transforming the logistics industry and its supply chains.

BUSINESS REDESIGN WITH BLOCKCHAIN TECHNOLOGY

A blockchain is a technology to store immutable information in a decentralised way by means of a distributed database that is managed and maintained by a community of users or servers. The real benefit of blockchain compared to other technologies is threefold. First, it creates trust in the network since information cannot be altered once it is added and, like internet technology, it is possible for all actors in the network to have direct access to the data as it is distributed through the network. Second, the use of cryptography makes it possible that the data can only be read by someone with authorisation. Third, smart contracts programmed in the blockchain allow direct payment if new blocks are added to the chain that comply with conditions defined by the creators of a smart contract.

Logistics is particularly challenging, since there are many actors and transactions in a supply chain. Actors in the chain generally keep only data that is relevant to their operations and do not know what transactions or events happened during previous steps in the chain. With blockchain technology, the original transaction and event data can be tracked back in a supply chain, which is especially relevant for customs compliance, food safety and insurance claims. Another practical benefit is that it allows shippers and forwarders to track shipments via blockchain. With the transparency enabled by blockchain, new financial models are possible to strengthen the supply chain. Financial transactions and payments can be triggered by events registered in the blockchain via a smart contract. For example, once a container has arrived in the port of destination, the ocean carrier can be paid automatically by the forwarder or the terminal handling charges can be paid to the carrier automatically by the consignee. The payment is immediately visible and can trigger the release of the container by both the carrier and the terminal.

Several research and business initiatives are developing blockchain applications for logistics in the Netherlands. The BlockLab is a field lab to support companies in defining and exploring the opportunities of blockchain.^{xxiii} A Blockchain & Logistics Research project has been initiated by a consortium of research institutes, financial institutions, ICT companies in logistics and logistics operators to develop specific use cases.^{xxix, xxx} Commercial solutions are developed and offered by several Dutch fintechs, such as Cargoledger^{xxxi}, Quantoz^{xxxii}, Safety Changer^{xxxiii} and TuriQ^{xxxiv}.



TransFollow

INNOVATION: SMART CONTRACT

Transfollow developed an app for use on smartphones and tablets to replace the paper consignment note. Upon signing off for receipt of the cargo at the delivery address, the data from the digital consignment note is made available on the blockchain by Transfollow, and ABNAMRO and triggers direct payment of the freight invoice based on a smart contract. ^{xxv}



INNOVATION: INVENTORY FINANCE

NBK Logistics is extending the inventory financing proposition to the blockchain providing a shared information position about inventory being held at its warehouse. This is a far more trustworthy method than existing systems. Because the inventory transactions are registered in an unrepudiable manner, a finance institution could almost automatically consider the goods for financing. This makes financing of inventory (especially for SMEs) practical, scalable and profitable. ^{xxvi}

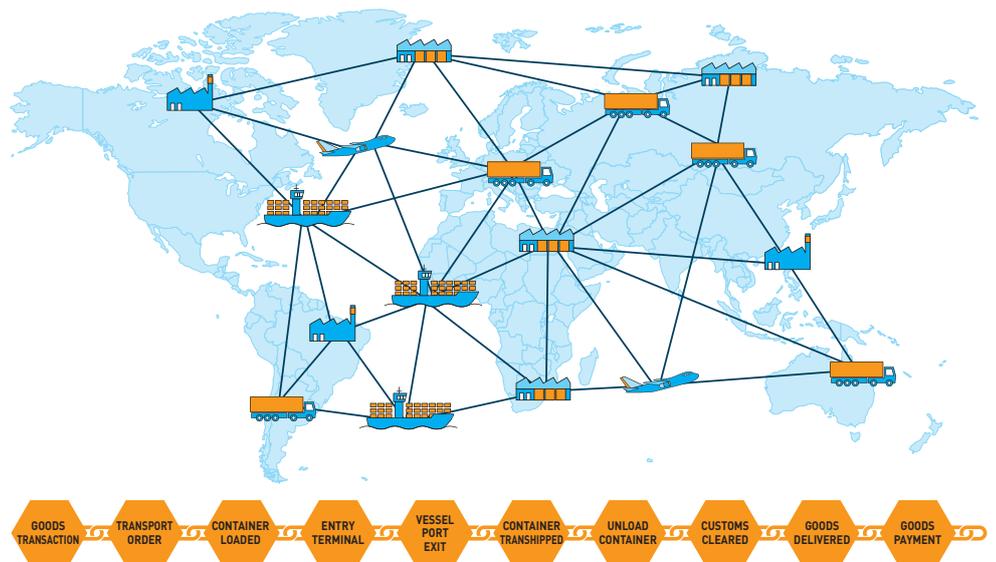


Figure 9: Blockchain in global logistics networks

At this moment, opportunities for the impact of blockchain in logistics seem endless but are also unclear. The impact can be high, but how blockchain will affect the roles and structure of supply chains is still to be explored.

1. The current focus of projects is on the application of blockchain technology for existing logistics processes and data exchange processes. In this stage, the emphasis is on exploiting the direct benefits of blockchain as an IT technology that facilitates data exchange in a (closed) network of stakeholders. This does not necessarily lead to business transformation, but makes supply chains even more efficient.
2. The next step is creating trust in a supply chain network with the transparency of blockchain technology. This will allow supply chain operators to deal quickly and efficiently with companies they have not traded with before, but they know that the risk of doing business is low based on the information in the blockchain. Business transformation is still limited.
3. The disruption in power will emerge from open solutions. For example, forwarding services that can make transport markets completely transparent and link shippers directly with operators that can handle their goods most efficiently. It could introduce a new business model that is not based on margins, but rather on the value of information gathering and processing and assessment of logistics services. Worldwide, there is a lot of attention on open solutions, although most are not available yet and the ones already out there are very small. The potential and scalability of this type of solutions is huge. In 2018, more products will become available on the market.

As logistics is the Netherlands' important strength, we should embrace the opportunities and address the future innovation challenges of blockchain:

- The logistics sector understanding blockchain technology and its possibilities; updating current processes and data infrastructure to accommodate future blockchain solutions; building ecosystems with stakeholders and competitors to be able to compete with the big established companies and the small open blockchain startups.
- Logistics service providers competing with completely open blockchain startups introducing new business models and services with blockchain engineering instead of implementing as-is processes on the blockchain.
- Roadmapping towards interoperability of data between different blockchain service providers and standardisation, albeit not hampering the blockchain innovation.

7. CALL TO ACTION: EXPLOITING THE ENERGY OF ENTREPRENEURS

The innovative strength of fintech is driven by entrepreneurship and the rapid development of technology: entrepreneurs see opportunities for improvements in existing processes and services, they recognise the opportunities of applying new technology and jumping into that gap. The higher pace in which entrepreneurs develop new services offers them a chance in the market, alongside the incumbent and established parties. The new services offer added value directly to customers and the success of innovative services. Unlike many innovations in logistics, they are not dependent on a minimum scale to be competitive. This is why the number of new fintech applications has grown enormously in recent years.

This process has created a dynamic fintech environment that is not centrally controlled or dependent on impulses from government or third parties. An industry driven development could also be an effective approach to successfully creating crossovers between fintech and logistics. This means that we do not opt for a programmatic elaboration of the mentioned ambitions, themes and development steps into research, implementation and facilitation. Rather, we visualise and support the energy and diversity of visions, ideas and concrete actions that live with individual entrepreneurs, knowledge institutions and governments. This offers interested parties or companies who have concrete questions and ideas the opportunity to directly take up these ideas or issues with others.

That is why at the end of this White Paper we offer the portfolio of Calls to Action of companies, research institutes and government that are in the middle of the cross of fintech and logistics and who would like to take the next step with others. Are you ready to join?

Don Ginsel
CEO & Founder, Holland FinTech

“For the Netherlands to remain competitive, cross-fertilisation of industries and beyond the core business is necessary. In the Logistics & Fintech programme, we built bridges between the fintech and logistics industries providing access to financial services knowledge and opportunities that would not have been on the radar of logistics businesses. Holland FinTech is keen to help logistics players the coming years to understand developments in financial services and help them access the best solutions available, so they can better perform in their core business. ”



Prof.dr. Albert Veenstra
Scientific Director, Dinalog

“Dinalog was a very proud partner in this initiative to bridge the gap between the logistics world and the fintech community. These are very different worlds indeed, but worlds that have much to offer to each other. Dinalog will strive to keep closing the gap in the coming years with research, networking events and other initiatives within the Topsector Logistics.”



Arthur van Dijk
Chairman, Transport Logistiek Nederland (TLN)

“By participating in this programme, TLN has connected our members with fintech solutions. There was particular interest in order processing, e-CMR and finance solutions. TLN recognises the increasing importance of finance in supply chains. Our members can play a large role, together with fintechs or independently. TLN will continue to increase the knowledge base of our members regarding the transaction flow of supply chains, together strengthening the logistics industry.



Michiel Steeman
Chairman, SCF Community

“The ambition of the Supply Chain Finance Community is to bridge physical and financial supply chains. This will result in more control, more efficiency, less risk and lower costs in our supply chains. Technological and financial innovations are indispensable pillars to realise these ambitions.”



Bart Banning
Sector Banker Transport & Logistics, ABN AMRO

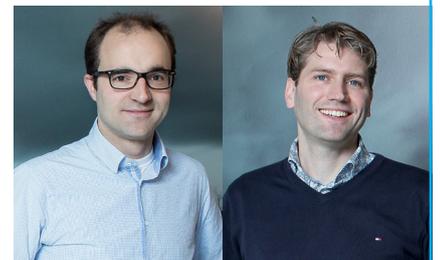
“Fintech and logistics are an important combination. In fact, a collaboration enables companies to achieve higher logistic efficiency or better utilisation of financial capital. This collaboration is exactly where the ambition of ABN AMRO comes in. Bringing financial knowledge and innovation together with shippers, logistic service providers and their suppliers. Adding value in creating the efficient supply chain of the future.”



Machiel Resink (I)
Co-founder & Financial Director, Synple

Roderick Rodenburg (r)
Co-founder & General Director, Synple

“For Synple, the Logistics and Fintech event was a great way to think out of the box. Although we already had strong ideas about how we can use fintech concepts in the Synple Platform for Sustainable Horizontal Collaboration, the students in our challenge made a valuable deep-dive that helped us get to the next stage of ideation. During 2018 we will explore the first options for these fintech options in the Synple Platform.”



Aljosja Beije
Logistics and Technology Lead, BlockLab

“Supply Chain Finance and blockchain are a match made in heaven. Blockchain holds the promise of immediate settlement of financial flows within the supply chain, flows that often take much longer than the physical flow. For example, a container is shipped physically from Singapore to Jakarta within 36 hours, yet the document and financial flows takes 7 days. Blockchain technology is however, still in its early stages, so living lab experiments are vital for making this a lasting marriage.”



drs Hans Togtema
Co-founder, Collect + Go

“Startup Collect + Go is a visionary member specialised in applying consignment note data in a whole new way. It is our mission to make it easier for truck drivers to collect and hand over their goods on every stop. All the way. We invite other members in the Holland Fintech ecosystem to build partnerships and business in cross-border data and goods exchange.”



Robert Blanken

General Manager & Founder, TransDocLink

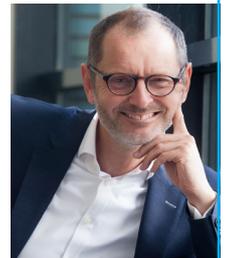
“Since TransDocLink is a company that operates between the financial industry and the logistical industry, we think we are a showcase of how to break through dogma’s and think about radical new business models using technologies like Distributed Ledger Technology (blockchain) and Internet of Things (IoT). We hope to continue doing so by sharing our thoughts with the rest of the Holland Fintech members and challenge each other to make the transformation happen.”



Thomas Wortelboer

Sector Banker Port & Logistics South West Netherlands, Rabobank

“Rabobank is one of the leading banks in the sector port & logistics. We are focusing on customers with a sustainable and innovative angle, which is vital in this rapidly changing world. By sharing our network and knowledge, we help our customers to innovate. I’m more than happy facilitating our clients in making their next steps to embrace new technologies in their proposition. Growing a better world together.”



Machiel Bode

Sector Banker Transport & Logistics, ING

“As financial service provider, ING collaborates with relevant organisations in the logistics sector as well as with fintechs. ING aims to create solutions that make supply chains more transparent, accessible and easier (and less expensive) to finance. ING does not direct these developments, but contributes as stakeholder in co-creation to deliver innovation to the logistics industry.”



Florus van Herpt

Founder and Fund Manager, Boozt24

“Boozt24 offers a supply chain financing solution based on the daily performance of the suppliers and buyers on the platform. It integrates goods and invoice- and cashflow tracking as well as financial performance of the actors in the supply chain. Boozt24 makes the actors risk-aware and solves the liquidity issues in the supply chain, enabling growth and efficiency. We will further support the Logistics & Fintech platform and look forward to implementing our platform into the sector.”



Jonathan Stolk

Co-founder, Safety Change

“Through the Safety Changer platform and apps, supply chains can set-up real-time workflows for exchanging information on goods, transactions, availability and shipping. The underlying blockchain provides for the trust each party can have in the integrity of the information exchanged. We look forward to connecting supply chain actors to our fintech solution to realise more efficient, competitive and profitable operation.”



Alfons Metselaar

Finance Director, Nabuurs

“Nabuurs was proud to be part of the Logistics & Fintech Challenge in Rotterdam. It proves once more that an open mind to new initiatives and challenges leads to enrichment of your knowledge and a better understanding of financing possibilities. Nabuurs will follow up with fintech by further exploring the opportunities presented.”



CONTRIBUTIONS

The following organisations actively contributed to the content of this whitepaper in interviews, roundtables, challenges, roadshows and research;

ABN AMRO	EARTH Water	Ministry of Economic Affairs	SD Insights
AFS Transport	Ebury	and Climate Policy	Softpak
Air Cargo Netherlands	Embassy Freight Rotterdam	ML Milestone Logistics	Sparkholder
Aramex	Evofenedex	Nabuurs Logistiek	Stockspots
Ardagh Group	Exact Software Nederland	NBK	Suit Supply
Argusi	Flinqer	NedCargo	Synple
Arnoldus Logistiek	FloraHolland	NeeleVat Logistics	Tagologic
Atradius	Flowconnect	NEOS Direct Lending	The Things Industries
BDP International	Friss	NHTV	Third
Becon	Gans Cargo Operations	NPEX	Tosoh Corporation
BeeQuip	Gaston Schul Group	OceanWide	TradeCloud
BeScope	HDI	Owlin	TransDocLink
BlockLab	headON	Panteia	Transfollow
Blue Rock Logistics	Heisterkamp	Paymill	Transics
Boozt24	Herbalife	Peter Appel	Transtar
Buckaroo	IBM	PickupBox	Turner
Bun.run	ICT Group	Port of Rotterdam	TVM
CapGemini	ilips	Port of Amsterdam	UnifiedPost
Cargonaut	Informer	Portbase	Urban Arrow
CargoSnap	Informore	Qualogy	Valid Aide
Cass Information Systems	ING	Quantalus	Value Engineers
Europe	Innopay	Quantoz	Verex Customs Services
Codirex Expeditie	Invoice Sharing	Quicargo	Voldaan
Collect + Go	iShare	Raab Karcher	Voordegroei
Conpend	Kable	Rabobank	Vopak
DBH	KLG Europe	Rijkswaterstaat	SCF Community
Debiteurenbeurs	KLM Cargo	Ritra Cargo Holland	Yes-Man
Declaree	Kuehne Nagel	Rotterdam Business School	Ziegler Nederland
Den Hartogh Logistics	LeenBakker	Route42	
Dnata	Mainfreight	Safety Changer	
Dutch Customs Organisation	Mezuro	Schenker Logistics	

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LOGISTICS & FINTECH PROGRAMME: FURTHER READING

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