CLIENT APPLICATION · API REQUEST · SERVER / DATABASE · API RESPONSE

DATA COMMUNICATION AS **DIGITAL FUEL** FOR THE LOGISTICS CHAIN.

AN **OVERVIEW**, **INSIGHT** AND **ROADMAP** FOR PROFITABLE **DIGITAL COLLABORATION**.

Whitepaper on applications, opportunities, challenges and to-do's towards better digital collaborations

An initiative of DALI, a pilot project for logistics innovation in the supply chain

LCB · MIDPOINT BRABANT · SMART LOGISTICS · REWIN · SUPPLY CHAIN PLATFORM ZUIDOOST-BRABANT SAMEN SLIM LOGISTIEK VOORUIT · vijfsterren logistiek

CONTENT

1 PREFACE

In logistics, communication and exchange of data between players in the chain is very important. Much of this communication and exchange of data still takes place in 'traditional' ways, such as by telephone and e-mail. This leads to manual processing, which takes more time than necessary and may result in human error.

The exchange of data is constantly increasing and this requires digitalisation. What opportunities and possibilities are available to companies that want to set up digital cooperation with their partners? And what challenges need to be overcome? And finally, how do you get started? This White Paper provides insight and guidance on how to get started with cost-effective digital collaboration and is written from the perspective of the DALI project.

The DALI project 'Data Science for Logistics Innovation' is a pilot project to upgrade and future-proof data science in the logistics sector in the south of the Netherlands. The DALI project implements concrete data applications in the supply chain based on eighteen business cases. Generic applications and tools are developed for the sector from these business cases. The DALI project intends to share the knowledge and experience acquired from the project with professionals and students in logistics and the supply chain. This White Paper contributes to this.

The DALI project is made possible by a contribution from the European Regional Development Fund in connection with OPZuid and by a contribution from Regio Deal Midden- en West-Brabant Makes and Moves.

2 THE PURPOSE

On average, small and medium-sized road carriers share eighty per cent of logistics data by telephone or e-mail.1 That is a huge amount of essential data that has to be manually sent, checked and processed every day. Errors and omissions in transport orders, such as incorrect addresses or missing loading instructions, are common and distract staff from performing their tasks efficiently. This costs entrepreneurs at least one and a half euros per transport order and increases the risk that incorrect or missing information will lead to errors in the service provision.

At the same time, the extent to which we exchange data is only increasing. Links to place status updates, prices or stocks automatically in the customer's system have become an indispensable topic during negotiations. Data sharing is also increasingly a key element in collaborations with partners or other links in the chain. Examples include the emergence of digital transport networks, online brokers and initiatives for paperless and data-driven transport,

such as e-CMR, Portbase and European-oriented programmes, and projects such as Basic Data Sharing Infrastructure (BDI), eFTI or FEDeRATED.

Despite this, there is still relatively little investment being made in improving data communication and there are still many questions about the opportunities and challenges it presents to entrepreneurs. Should I respond to the requirements of my customers or invest proactively myself? What can I improve and possibly automate? How quickly does an investment in data communication pay for itself? And which way of investing best aligns with my company's vision?

For over two and a half years, a team of experts and programmers worked exclusively on solutions for data communication between carriers, shippers and trading partners. Together with the company Adabt, they learned a lot about current opportunities, challenges and market movements from dozens of different business cases and over 300 interviews with logistics entrepreneurs and IT suppliers. They have now handed over the baton to new, more experienced leadership and it is time for reflection.

This White Paper reflects the thoughts and experience gained. It elaborates on the possible applications, opportunities and challenges, and gives carriers, logistics service providers and shippers concrete tips to take the first steps towards improved digital collaboration.

---

[1] *'National Research on Data and Digitisation in Logistics', published by Evofenedex, TLN and Beurtvaartadres in 2019: https://www.tln.nl/app/uploads/2019/11/Rapport-data-en-digitalisering.pdf*

3 OVERVIEW

The term data communication describes the automated transfer of data between the computer systems of two or more organisations in the logistics chain. Data communication can also take place within the own organisation, for example between a transport management system (TMS) and an on-board computer system, but this White Paper focuses exclusively on the first variant. Other terms that are used alternately in this White Paper and have the same or a more global meaning are digital collaboration, data sharing and horizontal chain integration.

Current applications

The best known applications of data communication in the logistics chain are the digital exchange of transport orders, invoices and arrival times. Other applications of data communication that are less well known include exchanging customs data, time windows, environmental zones or schedules. In most cases, however, a transport order or a collection of orders remains the main subject of the communication.

EDI and API

Techniques for data communication can be divided into two categories: techniques that fully automate the exchange of information and techniques that partially automate it. EDI connections and APIs are the most popular ways of fully automating information exchange worldwide. The most popular form of partial automation are online portals (see the next paragraph). Electronic Data Interchange (EDI) connections have been used since the 1970s and allow companies to automatically exchange data with external players. This can be a one-way exchange of data or a two-way communication involving feedback from the receiver, such as when customers ask for up-to-date arrival times. EDI connections communicate data in a particular format so that systems and possibly people can read the data without error. The most common format is XML. EDI connections are one-to-one connections. This means that at least one connection is required for each customer that wants to be connected. In many cases, customisation is needed for each connection, such as integrations between different working methods and ways of dealing with data. Data standards can serve as a common language between players and are a way to reduce the need for customisation and thereby reduce the investment required for EDI connections.

Application Programming Interface (API) is a newer technique and is used particularly for applications that run in the Cloud. However, because the majority of applications in the logistics sector do not yet run in the Cloud, the popularity of API is still very limited. Sectors with a less fragmented software landscape and where Cloud software is more common, such as financial services or e-commerce, are leading the way in the use of API. The practical operation of API is largely the same as with an EDI connection, but with the advantage that API is faster and therefore lends itself better to the exchange of data in real time. In addition, APIs are not necessarily one-to-one connections. Multiple players can establish communication with the system of one other player via an API. This makes API more efficient to maintain for the user and the software provider, but connecting to a multitude of external players also increases the likelihood of being hacked. Security risks can be mitigated by controlling access to APIs with authentication and authorisation tools, such as Auth0, and by encrypting data in code.

It is expected that API will be used more often for data communication between companies in the coming years, especially in situations where real-time data is important, such as when sharing arrival times or controlling warehouse robotics.

Because EDI connections have been widely accepted for years and because they simply work well in most cases, it will be a long time before APIs replace the majority of EDI connections.

Online portals

Despite the fact that complete automation of data communication has become much more accessible in recent years, it is usually only profitable to invest in a connection for customers with whom the most collaboration takes place. Online portals are therefore often used to enable data communication in situations where an investment in EDI is not an option, for example, because there is too little interaction with the customer, the customer does not want to participate in the investment or does not want to cooperate, or because the customer simply does not have a system with which the connection can be made. Online portals allow external players to manually enter or upload data. This data is then either manually placed in the TMS or, if the portal is linked to the internal system, automatically. Depending on the type of portal, customers can also view data, such as invoices and arrival times. An online portal allows the portal owner to automate a large part of its own data communication processes for a larger group of customers at one time. Because customers still have to enter data manually and, if they do business with multiple carriers, also have to work with multiple portals, it is not always easy to convince them to use a portal. Several companies therefore offer a discount for each order created through the portal or increase the rate for orders that are placed via other channels, such as by telephone or e-mail. A company that wants to set up an online portal can usually turn to its TMS supplier for a portal that is already largely finished and can therefore be put into use relatively quickly. It is also possible to choose to purchase the portal from an independent provider or to approach a specialised player for a customised solution.

Outsourcing or in-house?

There are various options for implementing and managing communication solutions between carriers and other players in the logistics chain. A common option is for the main software provider (usually the TMS provider) to handle the implementation and management of solutions. This may also be handled by independent IT consultants. In most cases, this type of service provision involves a higher one-off fee for implementation and a lower annual fee for keeping the link live. However, it is also increasingly possible to opt for a monthly licence model. Outsourcing of implementation and management is a particularly good option for companies with limited in-house IT expertise and capacity. This type of service provision is therefore frequently chosen in the SME sector.

Companies with more IT expertise and capacity can choose to implement and manage EDI connections themselves, either partly or completely. An integration platform (also called EDI platform) can be used for this. Companies can configure and manage data communication processes independently. Integration platforms come in different shapes and sizes. In some cases, the TMS provider offers this as an additional package, but the majority are offered by independent players.

Initiatives

Despite the technical possibilities and advantages that it can offer, digital collaboration is not yet sufficiently widespread. For this reason, several initiatives have been launched in recent years to encourage digital cooperation between companies. For example, TLN, Evofenedex and the Ministry of Infrastructure and Environment (Ministerie van Infrastructuur en Milieu) have embraced the open source data sharing model for logistics data developed by Simacan, the Open Trip Model (OTM), and placed it in the Uniform Transport Code Foundation (SUTC). The purpose of OTM is simple; namely,

to provide a common and standardised language for sharing logistics and traffic engineering data. This could eventually lead to companies dealing with data in a more comparable way and less work being required to translate data between organisations, enabling faster and cheaper implementation of data communication.

Other initiatives include DALTI, which promotes mutual cooperation between ICT suppliers; DALI and DDSZ, pilot projects to raise data mining in the logistics sector in the south of the Netherlands to a higher level; and Portbase, which makes the exchange of data with Dutch ports accessible. At the European level, various programmes and projects exist such as Basic Data Sharing Infrastructure (BDI), FEDeRATED and the European Electronic Freight Transport Information (eFTI) regulation that obliges governments to accept digitally delivered information by 2025.

4 OPPORTUNITIES

The extent to which we exchange data is only increasing. Not only because it is requested by customers and partners, but also because it offers great opportunities for our own organisation. But what opportunities are these exactly? Based on literature review and interviews with logistics entrepreneurs, established IT suppliers and start-ups, the six biggest opportunities were identified.

Saving costs and relieving staff

Data communication occurs primarily because it relieves administrative staff or planners of the burden of accepting and processing transportation orders and providing feedback on order status or other information. Performing the same work manually costs at least about one and a half Euros per transport order. This is based on an average of four minutes[2] per order for collecting, processing, retrieving missing data, correcting data if necessary, and informing customers about their order. This does not include the handling of invoices and service appointments. The extent to which customers require personal contact, the possible complexity of

transport orders and the content of feedback determine the exact amount of time staff spend on the manual exchange of data. For a rough estimate of the minimum savings potential, you can calculate the current cost of manual processing based on staff costs, the minimum time effort per transport order and the expected number of transport orders. Please note that savings may not only be found in the acceptance and processing of transport orders, but also in the reduction of administrative or operational errors due to incorrect or missing data. After all, it is often precisely the exceptional cases that can cost the organisation dearly. Please also bear in mind that the greatest savings should not be expressed in monetary terms, but in terms of staff hours that are freed up. Being able to deploy administrative staff elsewhere can be very welcome in these times of pressing staff shortages.

Quality of service provision

The manual exchange and input of data leads to significantly more errors than when it is automated with data communication. Examples of errors include incorrect address details, missing loading or unloading instructions, or the wrong description of goods. This can lead to time-consuming corrections, discussions with customers and partners or, in the worst case, errors in the transport output. Data communication enables companies to deal with data on the basis of predetermined rules. This not only reduces the risk of errors by your own staff, but also reduces the risk of incomplete data delivery. This contributes to the quality of your service provision and ensures that it is not the administration that is the key element in your contact with customers, but the customers themselves.

---

[2] *Based on 300+ interviews with carriers and a questionnaire conducted among 90 logistics service providers in cooperation with students from Tilburg University.*

Expansion of service provision

It is increasingly common for customers to request regular updates on their transport or other forms of feedback. Large companies in particular make data communication, often via an EDI connection, a precondition for a contract. Experience in implementing data communication may therefore be an advantage during negotiations. In addition, by proactively mapping out and sharing the various data communication options with customers, you can remove doubts about complicated and lengthy implementation processes. When mapping the options, think about things like pre-selected technical protocols, data standards and the type of data your company has experience with.

Rich data

Data communication not only enables companies to reduce the number of errors, such as in transport order data, it can also collect data more efficiently through connections to additional data sources, such as governments and data analysis companies, giving you greater insight into performance and helping you predict the future. Examples include traffic information, weather information, statuses of intermodal transport hubs and market data on the expected demand for certain goods. The number of online sources for contextual data is expected to grow significantly in the next ten years, partly due to strong subsidies from European governments and innovations from start-ups. Examples of existing online sources are Portbase for data communication with and around Dutch ports, and PTV xServer for historical and real-time traffic data.

New markets

Digital forwarders, online transport companies and freight exchanges have become increasingly visible in the market over the last five years. Home-grown examples include Quicargo, ChainCargo and UTURN. Other well-known providers are TIMOCOM, Transporeon and Sennder. Despite different specialisa- tions and descriptions, the providers are concerned with the same thing, namely selling transport services and monitoring the supply (in other words: carriers). Although a few providers have automated much of the matching of supply and demand, most still rely on telephone calls and e-mails to get transport orders to the right carriers. Nevertheless, the latter group will also be forced to automate intensive communication with carriers as much as possible in the coming years. And that offers a great opportunity for carriers. After all, data communication can contribute to the efficient collection of transport orders without long tendering processes and manual data processing. But more importantly, data communication makes it unnecessary to keep track of different platforms for transport orders on a daily basis. This provides access to new markets that can take load factors and profits to the next level, especially when your business is connected to multiple platforms.

Improved interoperability and new ways of working

Over the last twenty years, IT developments have already made several new ways of working possible. But whereas most of this innovation remained within the walls of the organisation, data communication will significantly improve the interoperability between organisations and their systems and enable new ways of working. For example, the automatic exchange of large amounts of data will enable warehouse robots to better anticipate incoming and outgoing transport movements. Digital access to a multitude of external entities and systems also makes it possible to efficiently issue queries to a large number of customers, such as when planning for better loading. In particular, the providers of systems that function best on the basis of extensive real-time data, such as robotics systems and planning software, will continue to develop their technology in the coming years to enable new forms of automation, and therefore new ways of doing things, through far-reaching integrations.

To keep in mind:

TMS providers
TMS providers are the most important IT service provider for many carriers and will continue to be the largest providers of data communication solutions in the coming years. A strong belief in standardisation on the part of suppliers and the limited willingness of their customers to invest do, however, mean that contracts increasingly have to be carried out by independent players. This is particularly the case for contracts (also called edge cases) involving unknown files and data structures and where the extent of the necessary customisation means that the service provision is not cost-effective for TMS providers. In order to reduce the number of edge cases and to make data communication as accessible as possible, TMS providers will continue to drive standardisation, whether united or individually, such as by using data standards and by standardising their own software so that the number of unique solutions under management decreases. Suppliers will also work on offering fast-to-implement standard data communication links with entities that their customers regularly interact with, such as large shippers and software commonly used by shippers. Consider, for example, a link between your TMS and Portbase, or with a common accounting package that many shippers use, such as Exact.

Platforms

Most logistics service providers do not yet see online transport platforms, including digital forwarders, as serious competition. In the coming years, providers of these platforms will try to link with as many carriers as possible in order to guarantee a good supply of routes and services. However, despite the fact that the supply is not yet as complete as that of the established players, IT has been a key element of platform providers since their inception. As a result, they can quickly develop their own software and have a fair amount of experience in attracting technical talent. In addition, many of these providers are supported by external investors in order to aggressively respond to the growing need of shippers for digital processes with more visibility and lower costs through automation. This money is badly needed, because many providers are not as advanced in the IT field as it seems and in reality differ very little from existing players. This means that, here too, there are intensive daily telephone calls and e-mails to arrange transport. In addition, start-ups offering platforms also face some degree of competition from existing, more conventional carriers launching neutral platforms in niche markets. Examples include Uturn, a container transport platform (currently an independent company) that originated with H&S Group, and Bulk Logistics, a Bulkio platform (currently also independent) that was launched by Van den Bosch. In the coming years, it will become clear whether platforms can actually automate faster and connect enough carriers to form serious competition for existing players.

Blockchain

Blockchain enables players to record data in an immutable and indelible manner. This creates significantly more certainty about the correctness of data and manual checks can be reduced. Even when data passes through several links in the chain. Given the relatively large number of errors in data communication - which often occur even after the implementation of EDI connections, for example - blockchain applications can make a major contribution to better data exchange. Currently, relatively few blockchain applications have been implemented. This is mainly due to a large knowledge gap, the lack of sufficient legal frameworks and the level of investment required to achieve a functioning application. Nevertheless, it is almost certain that blockchain will play a prominent role in the future of logistics. The White Paper Smart Supply Chain Contracts contains a comprehensive explanation and analysis of blockchain and smart contracts.

5 CHALLENGES

Data communication therefore offers ample opportunities for improving efficiency and service provision and for proactively responding to new market opportunities. The technology to do this has also been widely available for a number of years.

How is it possible, then, that such a large proportion of data is still exchanged manually? And why do SMEs in particular seem unable to find a sustainable solution to this? Various challenges mean that the required total investments in data communication are, or appear to be, higher than the returns. Here are the five main challenges that stand in the way of the rise of data communication.

Outdated software
The essential business software of most carriers is outdated. That is not necessarily a bad thing and, given that a TMS often has a minimum lifespan of ten years, it is also not very surprising. However, software based on outdated technologies is difficult to adapt, partly due to limited relevant knowledge and documentation. In addition, many IT suppliers manage a multitude of unique software with different customer-specific adaptations. This limited standardisation on the part of the supplier means that it has to make more effort to offer efficient data communication solutions for the entire customer base. This does not immediately make a solution impossible, but the time required to implement a solution can be significantly higher than when relatively new, standardised software is used. As a result, an investment in data communication may not be cost-effective.

No EDI connections possible at the customers
External players regularly use software that was not built for extensive logistics data and therefore cannot meet the minimum information require-ments of the carrier. As a result, small and medi-um-sized shippers in particular are unable to automate data communication without radical

changes to their own software. And if such an adjustment is possible, then paying for it is often a bridge too far. While this can be resolved by using standard templates or auto-completing data before it is placed in the carrier's system, such solutions require an investment that is often difficult to justify. This challenge is less common with large customers, either because they already use more complete software that offers sufficient options for logistical data or because there is sufficient in-house capacity to make the necessary adjustments at acceptable costs.

Many unique situations
Similar to verbal communication, data communica-tion only works when we speak the same language. Therefore, as with any form of automation, data communication requires a certain degree of uni-formity or standardisation in order to be successful. However, there are still hundreds of different ways of dealing with logistics data. This means that a lot of time and therefore money is spent on translating data communication between companies, especially if that data communication has to take place via EDI

connections. This investment is easy to calculate for the largest customers, but if the manual exchange of data is to be reduced as much as possible, this investment should also be feasible for customers who do not want to use the alternative solution: the online portal. And that seems a long way off for the time being.

Resistance

Far-reaching changes rarely work out well in the ever-changing logistics sector, especially when it comes to automating existing processes. When processes become less tangible and visible as a result of automation, the comfortable sense of being in control often dissipates. People also need to learn to trust the systems. As a result, implementing and improving data communication frequently creates resistance from staff who you would prefer to see adapting to the improvements you envision. However, the practical consequences of investing in data communication are relatively limited and much less drastic than implementing a new TMS, for example. In addition, investments in data communication solutions are often considered on a relation-ship-by-relationship basis, which means that rarely is automation implemented at one time to such an extent that jobs are at risk. This means that, despite the fact that it should not be underestimated, internal resistance is usually very low. More resistance usually occurs in relationships with customers and partners. After all, the implementation of data communication always requires the cooperation of the other player. Not infrequently, organisations find it difficult to ask customers to contribute towards a solution. Such as when the delivery of another type of file speeds up the implementation of data communication or when the customer needs to use an online portal. Especially when it comes to a large, seemingly powerful customer or partner, entrepreneurs tend to compromise. Instead of jeopardising

the relationship, they tolerate a more expensive technical solution or they do not invest in a solution at all and accept the disadvantages of manual data exchange. Again, small and medium-sized carriers generally have more difficulty convincing customers of the need for their new investment than large carriers.

No priority (as yet)
Investing in data communication is rarely a priority for companies. This is hardly surprising since, in addition to the day-to-day hectic activities that are part and parcel of working in logistics, there are plenty of other opportunities and challenges to focus on. Realising a visible return on investment in data communication is also difficult because it mainly involves staff hours. Investments in data communication are therefore made primarily in response to customer queries or requirements. In addition, it is unrealistic for most carriers to invest more proactively in scalable and more sustainable solutions, because they simply do not have enough IT staff. The limited amount of proactive investment means that there is not enough money in the market for IT suppliers to develop sustainable and more accessible solutions and that support for standardisation is still limited.

Digital competition
While investing in data communication is not yet a priority for many carriers, logistics start-ups and scale-ups are capitalising on the market opportunity this creates. Digital forwarders, online transport companies and freight exchanges are investing heavily to offer the most complete digital environment possible for low-threshold transport procurement.

It is clear at present that platforms do not yet represent significant competition for carriers. Despite the fact that providers have modern software, they still have to invest heavily in order to create a competitive transport offer. Nevertheless, digital convenience will become increasingly important to customers, there is a limit to the number of platforms that customers are willing to keep track of, and, in the future, new providers will be able to drive prices down with advanced automation and data mining. Once the market has reached that stage, it may be too late for carriers with limited data communication solutions to compete with players that have had IT centricity for years.

6 GETTING STARTED

Conclusion

One thing is certain: data communication will only become more important for logistics companies in the coming years. The sector is well aware of the need to work more with data and that it is therefore crucial to collect a lot of valuable data. In many cases this is already happening within organisations, but data will need to be collected from the entire chain in order to remain competitive.

Large organisations that are already doing this are now reaping the rewards, such as Amazon. However, small and medium-sized carriers still have a long way to go before they reach that stage. Over eighty per cent of the data is still exchanged manually and there seems to be little motivation to invest more proactively.[3] This is not surprising, because for many players the investment is higher than the return.

But that is precisely the point. Companies still too often approach investment as a short-term opportunity for efficiency improvement at the customer level. In most cases, carriers invest because customers demand it or because the costs of manual communication are too high. These are logical reasons, but they do ensure that customers determine how your business handles data. And because the way in which data is handled will be so important in the years to come, it is wise to stop using just that one efficiency improvement as a motivation for investment and instead follow a larger, long-term data strategy.

To succeed, companies will need to take a broader view and create a concrete picture of what the data-driven future will look like for them. What opportunities are there, for example, if you have

insight into potential orders from dozens of different platforms? Can you approach a new segment of customers if you can guarantee rapid implementation of data communication? Or otherwise, what problems will arise if you lag behind in these innovations? How else can you work smarter without data and automation, with fewer staff and resources? Other sectors teach us that a competitive backlog of data is very difficult to overcome. So time to get started!

---

[3] *'National Research on Data and Digitisation in Logistics', published by Evofenedex, TLN and Beurtvaartadres in 2019: https://www.tln.nl/app/uploads/2019/11/Rapport-data-en-digitalisering.pdf*

What you can do

Create a vibrant picture of a data-driven future. That sounds nice, but what exactly does it entail? It involves defining in a tactical plan the initial frameworks for how your company handles data. To create such a plan, you and your colleagues and relevant customers evaluate your current outlook and your expectations for the future.

The plan serves as a dot on the horizon and provides the rationale for whether or not to proactively invest in solutions. Because data innovation is still a relatively new and trending topic, it is important to keep the plan 'vibrant'. This means that you start by outlining frameworks based on what you already know or find and regularly add to or adjust the plan with new know-how. A good first draft of the plan should answer the questions below, at a minimum. Please note that only you can provide the best answer for your company.

1 At a minimum, what data do I want my company to collect or share, why do I want it and in what way?
Is data essential to operations (e.g. transport orders), is it to enhance service delivery (e.g. arrival times), is it to gain more insight, or is it needed to enable robotisation in the warehouse? Take stock of what data streams you already have and what options are available to set up missing data streams, for example by implementing an online portal that also translates PDF files or by using new telematics. Can your current IT suppliers provide this, can you acquire resources to do this in-house or is it wise to develop this with fellow companies?

2 Who or what constitutes online competition and what are online opportunities for my business?
Consider whether online transportation platforms are an opportunity or threat to you. Why would your customers or potential customers switch or not switch to an online provider? Or is it instead interesting to partner with multiple online providers and create a pool of potential orders?

3 How do I avoid dozens of different ways of working?
The costs of data communication solutions are mainly too high because many customised translations are required of the different working methods and data of companies. Therefore, decide carefully what you want the data that you use internally to look like and which translations you want to be able to perform quickly. By maintaining data standards, such as the Open Trip Model, you can take a big

step towards organising your data. This does not mean that you have to oblige every customer to deliver data in a certain way. At the moment, data standards are simply not sufficiently supported by shippers. It does, however, ensure that your company is aware of the target situation and that working methods are less likely to be dictated by customers. Also, do not think that all data is relevant and remain consistent in your policy. For data, quality always prevails over quantity.

4 **How do I want to deal with technical talent?**
The growing importance of data is creating a strong demand for talented individuals with an understanding of data science and IT. Based on your answers to the above questions, consider whether and when it is wise to recruit these talented individuals. In addition, keep in mind that a lot of talented individuals are still relative-ly young and have limited knowledge of your possibly outdated IT landscape. How do you ensure that your company is attractive to young and ambitious talented individuals in a discipline that is still relatively unknown to you?

Are you looking for practical help with further automation or data refinement? Please contact LCB or your regional partner. We will be happy to help you further via our experts, our network or easily accessibly via Fresh Brains (students).

Would you like a scan to map out the 'state of automation and data availability' of your company and gain insight into what the logical next steps are for further digitalisation? We are happy to help you with the digitisation scan.

Are you a start-up looking for support in market validation of your product, would you like to start a pilot in the supply chain or would you like to get in touch with shippers or logistics service providers? We are happy to help you through our Pitch Logistics network.

Would you like to know more?
www.dali.lcb.nu

Alternatively, please contact:
Logistics Community Brabant
campus Breda University of Applied Sciences - Frontier building
Mgr. Hopmansstraat 2
4811 DK Breda
E-mail: info@lcb.nu
Tel: +31(0)76-5332645
www.lcb.nu

We are happy to assist you.

Author
This White Paper was written commissiond by Logistics Community Brabant in the DALI project. This White Paper reflects the thoughts and experience gained in developing and realising digital collaborations between partners in the logistics chain. It elaborates on the possible applications, opportunities and challenges, and gives carriers, logistics service providers and shippers concrete tips to take the irst steps towards improved digital collaboration.

NEW SENSES OF LOGISTICS

GIVE YOUR BUSINESS A **BOOST** WITH **SMART SENSORS** AND **SMART USE** OF **DATA**

White paper on new applications for sensors in logistics
An initiative of DALI, a pilot project for logistics innovation in the supply chain

WHITE PAPER

VERKENNING VAN DE **KANSEN VOOR AUGMENTED REALITY, VIRTUAL REALITY** EN **SERIOUS GAMING** IN LOGISTIEK EN SUPPLY CHAIN

CHECK OUR WHITE PAPERS, AVAILABLE AT: DALI.LCB.NU