

INSIGHTS INTO GLOBAL TRANSPORT AND LOGISTICS

FORWARD LOGISTICS

2019



POWERED BY THE DSV INNOVATION LAB



Forward Logistics

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| 03 — Foreword | 32 — An overlooked hurdle to unfolding predictive analytics |
| 04 — The state of logistics in 2019 | 36 — The pillars of seamless e-fulfilment |
| 08 — Tracking in real-time |  Did you know? |
| 10 — In this trade war, there are no winners | 40 — Brokerage boom |
|  Did you know? | 44 — Supply chain segmentation starts with a C |
| 14 — Full transparency. Putting blockchain to work | 46 — Political steps important to faster green transition |
| 16 — How will batteries drive an automotive future? | 50 — Wired co-workers |
| 20 — Fail to plan. Plan to fail |  What happens to your cargo? |
| 22 — Artificial intelligence in logistics | 56 — 10 ways to reduce transportation costs |
|  Did you know? | 60 — Phishing for weak spots |
| 26 — Mine your data. Find your gold | 62 — Inventory optimisation is basically a balancing act |
| 30 — The next phase of 3D printing | |

Welcome

We recently asked some of our many knowledgeable people across the organisation if they would be willing to share an insight from their areas of expertise with our customers. Their response was so positive that we decided to turn their input into an entire report – resulting in this, our first *Forward Logistics* report.

At DSV, our customers are a very diverse group of people and businesses. Every day, we have the pleasure and the privilege to serve everyone from small, family-run businesses to global corporations. And within those organisations, there are people with many different functions, from logistics and operations to the highest levels of management.

This diversity means that not every insight in this report may be relevant to you and your business – but we hope that you will find a lot of it interesting.

The experts you'll meet on the following pages share their expertise with our customers every day. They are focused on moving DSV forward using new technology and new ideas in order to do the same for you in the future. That said, their insights are most definitely focused on topics that are relevant today – not just topics that might be relevant 10 years from now.

If you want to learn more, I urge you to follow us on LinkedIn where we post insights and news on a regular basis. And if you have a transport or logistics need, don't hesitate to get in touch with us.

I hope you enjoy the read.

Best regards



Jens Bjørn Andersen
Group CEO
DSV Panalpina



The state of logistics in 2019

Despite recent concerns about recession and the drift towards ‘reversed globalisation’, world economic growth is still expected to rise.

The logistics industry
needs to innovate.

According to the International Monetary Fund, the global economy is projected to grow by 3.0 % in 2019 and 3.4 % in 2020. The IMF’s outlook was adjusted downwards in October 2019 because of the negative effects of trade tariffs implemented in the USA and China.¹

As a mover of goods, it is hard to find another statistic that better paints the outlook, and potential threat, for our industry.

Brexit, trade wars and related developments are all part of a trend towards what you could call reversed globalisation. Some say this started with the financial crisis

in 2008 and the tremors it sent through economy and culture. And it may well be. But the question now is whether this trend takes hold and becomes long term, or if it is just a moment of insecurity in the world’s economic development.

REASONS TO BE OPTIMISTIC

There are, however, reasons to be optimistic. As a logistics professional, I am of course happy with the increased demand for the transportation of goods. Transparency Market Research have estimated that the value of the global logistics market will rise to USD 15.5 trillion in 2023 from USD 8.1 trillion in 2016.²





Other reasons to be optimistic are the digital and technological possibilities that lay before the logistics industry. Whether it's crunching data into more predictable transportation, using robots to carry the heavy load in warehouses, or developing blockchain solutions that increase transparency and minimise slow, manual processes, innovation allows us to offer our customers a better experience.

The new generation of logistics customers want to easily find the services they need, and they have high expectations regarding precision, reliability, and responsiveness. If something does not go according to plan, they want to be notified early enough to take remedial action and thereby prevent disruption in the end. They also expect logistics companies to act in a responsible way that does not trample on the environment.

Our ability to respond to increasing demands will be key in winning tomorrow's logistics customers. And so will our ability to break down complexity. With more and more data sources and technologies, the possibilities for combinations are endless, but if we don't keep things simple for our customers and for ourselves, we can lose track.

DIGITAL PLAYING FIELD

– NEW RULES

On the new digital playing field, we also see a race to become the most efficient player in the industry. Driving down costs is key to offering our customers the service they expect, at the price they expect.

Our own initiatives in 3D printing, predictive analytics and robotic process automation are examples of potential game-changers in the industry. The players who are quickest to make the most out of these innovations will have an advantage – and that comes down to people. Digital developments won't matter if you don't have the right team.

But does all this innovation mean that our vast experience as a logistics provider is useless in the new world? No, it does not. I believe that we can take our knowledge with us to this new playing field and embrace the new opportunities to move our customers, our business, and our industry forward.





Tracking in real-time

Logistics providers are getting closer to solving the complexity of tracking cargo shipments in real-time. At DSV, we make use of both cutting-edge and established technology.

As consumers, we have become increasingly demanding when it comes to getting what we order delivered. We have a low tolerance for delays or damages, and we don't hesitate to complain publicly so that other shoppers, and the retailer, can see what has gone wrong. Moreover, a study from 2017 showed that almost 50% of online shoppers consider 'full visibility on delivery process' as the most important delivery element.¹

This development over the past few years has seen us bring that behaviour to work, meaning that high demands and low tolerance for mistakes now also apply to business to business logistics. Maybe even more so. Not only are the high consumer demands trickling down the supply chain, but companies are also under pressure to minimise costs in order to compete. Precision, speed, and low costs have become parameters that can make or break businesses.

Orchestrating those performance parameters requires visibility, and an essential part of visibility is knowing when shipments are going to arrive.

A VAST NUMBER OF VARIABLES

The industry's race to make end-to-end real-time cargo tracking and ETA (estimated time of arrival) prediction a reality has been going on for years. One challenge has been finding technology that can make it happen. Radio-frequency identification (RFID), for example, was heralded 20 years ago as the breakthrough needed, but today, barcode scanning is still the industry's most widely used method for tracking shipments.

Another challenge is the complexity of the shipment delivery process. If all there was to it was moving a package from A to B, then a basic GPS receiver could take care of both tracking and estimating arrival time. But road freight, for instance, is much more

complex. You have organisational factors to deal with (delivering to multiple locations; delays that can happen at each location), weather factors (rain or wind can lead to congestion), traffic factors (congestion, roadwork, accidents), and human factors (route planning, driving style, experience, incentives) just to mention a few.

“ Not only are the high consumer demands trickling down the supply chain, but companies are also under pressure to minimise costs in order to compete ”

Søren Krejberg

For freight forwarders, another big challenge is that many different suppliers can be involved in the delivery process, and setting up interconnected tracking throughout the delivery process requires everyone involved to work on the same system and provide the same output.

ROAD TRACKING IN DSV

At DSV, we are developing real-time tracking of road shipments by combining both new and old technologies. While we already offer several tracking services, the challenge remains to get closer to real-time.

In one pilot, we start the process by scanning shipments when goods are picked up

from our warehouses. Before leaving, the driver receives a suggested delivery route, while the consignee receives an ETA. The ETA is based on variables including driving time and distance. If there is a delay at one of the destinations, a new ETA is estimated for the remainder of the route, and a new status message is sent to each consignee and the shipper. All the information is delivered through our customer portal, myDSV, and can include push notifications to a mobile phone.

The next development step involves using the existing GPS information to live-track shipments and add machine learning to more accurately predict ETA. Besides driving time and distance, DSV's machine learning model crunches a wide range of historical transport data to predict how any given shipment is going to proceed. Every 15 minutes, it makes a new prediction for when the shipment will arrive based on the GPS information. If suddenly the predicted arrival time is off target, a notification is sent to the consignee. The clever part is that the model learns along the way – so if ferry times, rest times or anything else changes, the model's predictions change with them.

DSV's real-time tracking developments show strong results so far, and it's an area that has our highest attention. Because with increasing expectations for precision, speed and cost control, knowing where shipments are and when they are going to arrive can make the crucial difference.



In this trade war, there are no winners

COMMENT

Recent policies of setting up barriers to trade is a lose-lose development for businesses and individuals. The question is whether we are entering a new era of strained international trade relations – or if the current complications will be short lived.

In March 2018, the US President asked the US Trade Representative to investigate applying tariffs on \$50-60 billion worth of imported Chinese goods, calling it “a response to the unfair trade practices of China over the years.” Later, China’s Ministry of Commerce responded by imposing tariffs on imports from America, including aluminium, aeroplanes, cars, pork, and soybeans.¹ Many retaliations later, we can look back on a trade war with few winners and plenty of losers.

And that war is still raging, with the consequences becoming ever more apparent. Data shows that China’s total exports to the US dropped by more than 7% in the first five months of 2019 and, for goods subject to these new tariffs, China’s shipments to

the US dropped 30%. In the US, exporters are hurting as well, with data showing a 38% decrease in tariff-hit exports to China.² An analysis by Goldman Sachs in August 2019 showed that the US economy may even enter a recession because of the trade war.

Besides the restrictions on trade with China, recent US policies have included withdrawal from the Trans-Pacific Partnership, renegotiation of trade agreements with Mexico and Canada (NAFTA) and South Korea (KORUS), as well as blocking appointments in the Appellate Body of the World Trade Organisation (WTO).

These decisions are having real-world consequences. Some companies are making considerable changes to their supply chains because of the trade war, choosing to source materials from countries other than China to avoid paying the additional duty. Other companies are passing the bill down to their customers. “The impact of tariffs at 25% will result in price increases which will be felt by US consumers,” said the CEO of Best Buy, Hubert Joly, in June 2019, responding to the proposed US tariff increase from 10% to 25%.³

Companies with less at stake are waiting to see if the situation will be resolved in the trade talks between the US and China. Pressure from US companies is not going unnoticed in the White House, but since the trade war has escalated and become a central part of the current administration’s political agenda, the US president is likely looking for a suitable way of declaring himself the winner regardless.

“ **Some companies are making considerable changes to their supply chains because of the trade war** ”
Neil Munro

As this plays out, some countries are reaping the rewards. For example, Vietnam is experiencing a boom in trade with the US as a direct result of the US-China trade war.⁴ While that may be good for Vietnam, it adds a layer of complexity, as it would appear some Chinese goods have simply been transported to Vietnam, relabelled and then illegally exported to the US as Vietnamese origin in an attempt to evade the additional duty. The challenge is to differentiate between relabelled products and those which are legitimately of Vietnamese origin.

In Europe, Brexit also adds complexity. If a ‘no-deal’ Brexit becomes a reality, it will



eliminate the tariff-free trade status the UK has with EU countries and UK membership of all EU Free Trade Agreements. The costs of trading between the UK & EU27 will increase as new tariffs combine with delays and costs of customs checks at UK and EU ports, as a result many traders will need to revise their supply chains. Thus, the complexity of international trade deepens again.

Though there are signs that the current complications initiated by the US and UK have short or medium term impact, there are other challenges in international trade that cause more long-term concerns; sanctions on certain countries and the threat of international terrorism are also trade barriers. Companies must increasingly check on people they hire, companies they work with and goods they trade. Today, you need to demonstrate that your compliance setup and processes are operating effectively, or risk heavy penalties and lose business.

It may well be that the US reaches an agreement with China that ends the trade war, it may be that Brexit happens in an orderly, not-too-costly manner (or not at all), and it’s possible that the US ratifies NAFTA’s replacement, USMCA, but companies nevertheless need to be prepared for new and ever changing levels of complexity in international trade, and be able to make rapid changes to their supply chains in the future.

Singapore and Switzerland have the **highest quality of roads** in the world with a score of 6.4 out of 7 in the World Economic Forum's rating system

(Source: World Economic Forum)

**IT TAKES OVER
60 MODERN TRUCKS
USING TODAY'S DIESEL**



TO EQUAL THE PARTICULATE EMISSIONS OF **A SINGLE TRUCK** PRODUCED PRIOR TO 1988.



Full transparency.

Putting blockchain to work

In the increasingly complex world of logistics, blockchain technology can provide real-time transparency and reduce manual processes.

With more and more focus on real-time transparency to optimise efficiencies, the world of logistics long mired in bureaucracy, manual processes, paperwork and heavy administration can seem strangely dark. One development with potential to illuminate the darkness is blockchain technology, which is projected to reach a market size of \$23 billion in 2023 – from \$2.2 billion in 2019.¹

Roughly speaking, a blockchain can be thought of as a decentralised, cryptographically secure, verified digital ledger where each entry is permanent and viewable in real-time by every interested party. It's cryptographic and decentralised nature makes it 'secure by design'.

Blockchain is widely being tested and piloted in the logistics industry. Examples include the port of Shanghai, one of the busiest in the world, that is working to save

time and trading costs in its clearance processes by implementing blockchain into its online port clearance system.² Another example is Walmart that has created a food traceability system based on blockchain. It enables the company to trace food all the way back to individual farmers in case of food-borne disease breakouts.³

An example from DSV is our pilot test to replace paper documentation for Electronic Original Negotiable Documents in Israel. Starting with small export transactions over several months, we scaled up and successfully completed a total paperless LoC (letter of credit – or transportation document) across all parties. The results speak for themselves with us saving **2 days** of document transportation time, as well as **savings of \$30** on this journey alone. We estimate if we extended this to the entire trade route, we could **save 6 more days and ~\$150** as well as **risk reduction** for



How blockchain may change logistics over the coming 5 years



all parties. Imagine what those savings would amount to over the entirety of a logistics operation?

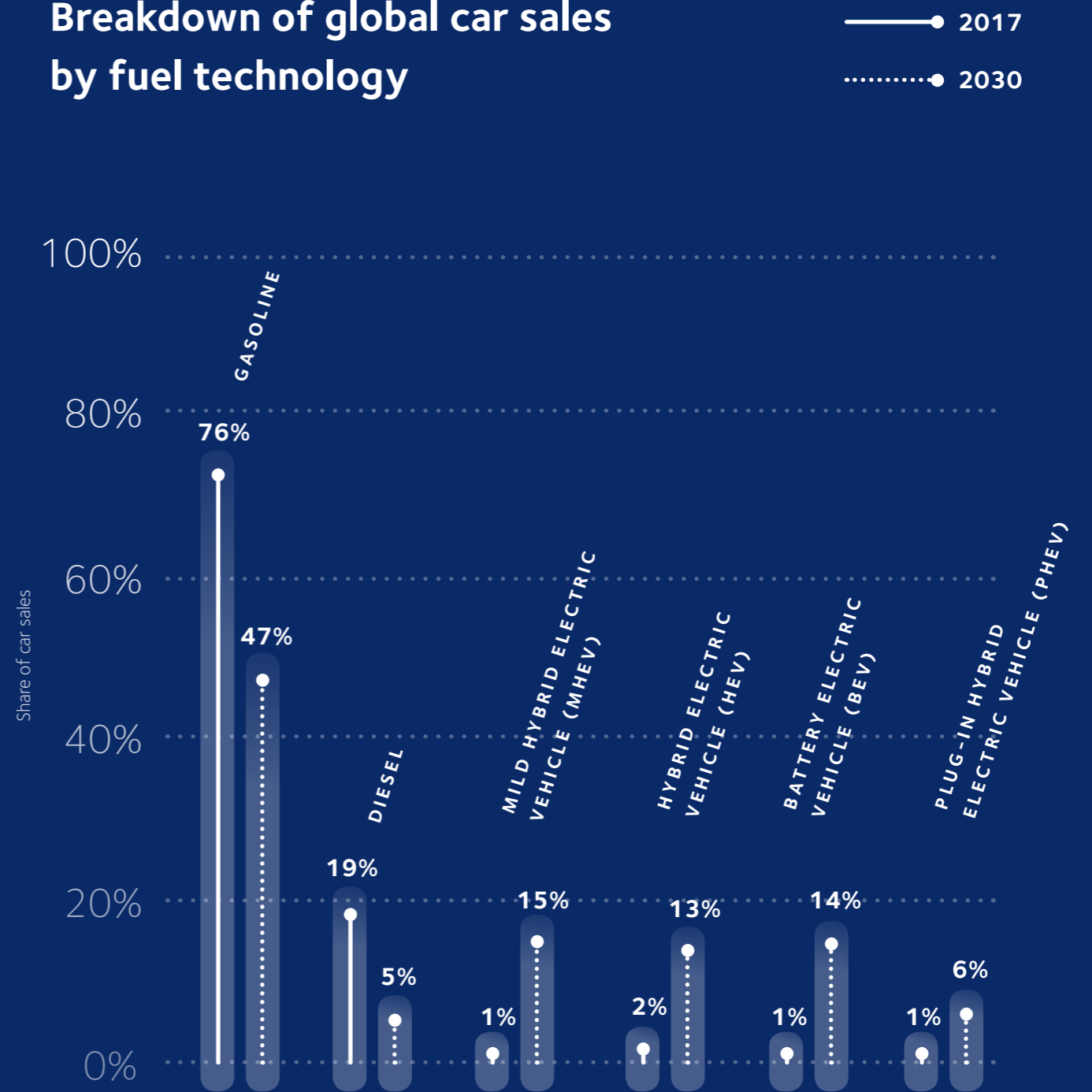
Armed with those findings we partnered with Wave, a start-up company that acts as a platform for original documents – digitised as opposed to paper – based on

blockchain technology. With the same legal standing as paper, but with increased transparency and flexibility Wave provides us a foundation to step into the future, prepared. And with an increasing number of customers asking for more transparency, we'll be ready to supply.

How will batteries drive an automotive future?

Battery-powered electric vehicles are expected to take a growing share of the automotive market over the coming years, but uncertainties in the market make their future hard to predict.

Breakdown of global car sales by fuel technology



2030 numbers are projected (Source: Statista)



Projections by Bloomberg, OPEC, and Exxon show wildly different figures for how much sales of electric vehicles will rise in the future. Bloomberg sees around 548 million electric cars driving around the world in 2040, while Exxon, maybe not surprisingly, is at the other end of the scale with a projection around 162 million in 2040.¹

What is certain, however, is the growing interest in greener solutions and increased societal demands on companies – particularly in the transport industry – to do something about their environmental footprint. And with billions of dollars invested in electric research and development by the automotive industry, the question isn't 'if' battery electric vehicles will begin dominating the streets – but 'when.'

That being said, the market is still immature, with car manufacturers, governments and consumers still trying to work out how electrification fits their agenda. Here are just a few of the uncertainties.

1: BATTERY STRATEGY

Car manufacturers are still figuring out their strategy around batteries. Will they build or buy? How will they build their supply chains around batteries? And what are they going to do with the batteries once they reach end-of-life and need recycling?

For a car manufacturer to become a battery-producer would consume large amounts of capital that can be applied to

RD in other areas of technical innovation such as autonomous and mobility. The investment would also pose a risk due to the market still being so immature. The risk extends to the availability and price of the, in many cases, hazardous and rare earth elements needed to build the batteries. From a supply chain standpoint, shipping, storing and moving batteries are processes that manufacturers are not doing today on a large scale and would have to be developed.

Tesla has taken the risk and is currently building its second giga factory to produce the batteries they need. Like Henry Ford, who owned all the links in the supply chain right down to the lumber yards supplying the wood for steering wheels, Tesla is very much vertically integrated, building their own batteries and manufacturing most of the components that are in their vehicles, rather than sourcing them from sub-contractors.

Another battery challenge is what to do with them when they are no longer usable. The batteries in battery-powered electric vehicles can't simply be thrown onto a landfill – they need an end-of-life plan. This plan is still nascent with many of the traditional manufacturers due to the relatively small percentage of the market.

2: GOVERNMENT POLICIES

What can make or break the development of the battery electric vehicle market is how governments choose to regulate it.

The optimistic projections for the market are reliant upon governments deciding to incentivise buying battery electric vehicles instead of traditional vehicles. Tax incentives that make it realistic for the average consumer to buy an electric car are essential for the market to see the critical mass that leads to maturity. We have seen sales skyrocket when new tax incentives for battery electric vehicles have been implemented, and conversely, we have seen sales drop dramatically when incentives have been taken away.

Infrastructure will be another important driver for consumers' willingness to invest their money in battery electric. Today, if you are going to drive a couple of hundred kilometres in a battery electric vehicle you will need to plan ahead in order not to run out of power along the way. Even in developed infrastructures, battery charging stations are fairly few and far between. That makes it a hassle for consumers – and a purchase demotivator. If governments decide to invest in better infrastructure for battery charging, it could tip the scale in terms of making consumers switch.

3: COMPETING TECHNOLOGIES

What if another technology emerges that make battery-powered electric vehicles old news?

One example of such technology is the breakthrough in hydro-electric vehicles. Hydrogen is a fuel that you have in a tank,

and that you fill up like you fill up the tank in an internal combustion engine car today. That means existing infrastructure of gas stations could be repurposed for hydrogen cars. Even the time it takes to fill a hydrogen car and a traditional car are similar, so it would be an easy switch for consumers. The problem with hydrogen, still, is that converting water into hydrogen is a very expensive process. In addition, hydrogen is hazardous, and would people be OK with essentially driving a hydrogen bomb?

Autonomous vehicles are attracting huge investments, research, and attention today, and it is safe to assume that they will be here within the next five to ten years in some way. Among the biggest challenges are the moral decisions that are essentially coded into the vehicles. The code needs to determine what decision the car will make when the choice is continuing forward and hitting a pedestrian or swerving into a bus to the right. How do we prevent bias in the decision-making of the car? But there is no question that when the majority of cars on the streets are electric and communicating with each other without human interference, traffic will be a lot safer.

A plus for battery electric vehicles is that they go hand in hand with the development of autonomous vehicles. The architecture of electric vehicles will be a lot easier to retrofit into autonomous vehicles compared to retrofitting traditional cars. But just how this future is powered up, is yet to be seen.



Fail to plan. Plan to fail.

Studies show that 90% of start-ups fail.¹ Many of them because they neglect to focus on going to market – including logistics.

Interest in start-ups has grown steadily over the past decade with investors now, more than ever, willing to take a chance on a new idea. According to Statista, start-up funding across all industries grew by at least 50% worldwide between 2012 and 2017.² Many companies are jumping at the chance to find cost-saving solutions that can help them become more competitive in increasingly volatile market conditions.

So far, so good. The problem lies however in planning. Many start-ups are set up by young talent with great ideas, using invested funds for research and development, prototyping and press – the fun stuff. But when it comes to reaching the market with their product, many start-ups neglect to set aside funds, or simply don't know what it takes logistically, to get their product delivered to their customers.

That's why having a focus on the people you are trying to reach with your product, including how to reach them, is crucial.

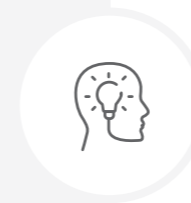
**THEY WANT IT ALL.
 AND THEY WANT IT NOW.**

With consumers' increasing demand to have speedy, low-cost delivery as standard,

they're unlikely to forgive mismanaged expectations. That's why start-ups need to understand logistics in order to succeed and bake in capital for the right supply chain setup. That might include inventory management, manufacturing setup, trade rules understanding or customs compliance, and they need to find out what it will cost and what the right way to do it is. How do they do that best? By engaging with the professionals who give them options that are fit for purpose.

Many start-ups think that working with a third-party logistics company is a complex and inefficient solution, but that may not be the case. A solid inventory setup and an efficient distribution method are some of the goals that a 3PL can help you achieve. At DSV, we have a service called DSV Start-up – a team dedicated to helping start-ups with their logistics setup.

In today's global market, not being able to reach a customer sitting on the other side of the planet can make all the difference between success or failure.



Tips for getting started on a logistics setup:

Select a strategy

For example, if a value proposition for your product is fast delivery times, then spend more on logistics. If your strategy is to offer a low cost, then compromise on lead time and focus on cheaper transport options.

Plan

Good sales forecasting and operations planning will help you understand when you might need new equipment or overtime. Analyse your shipping needs carefully, and plan for full truckload shipping when possible. You may also need contingency plans in case there are deviations.

Keep track of costs

Know how much you spend on each aspect of your logistics and supply chain. You can't control costs if you don't know where you're spending.

Find a partner

Many start-ups don't have the time to negotiate or get quotes from several suppliers. Finding a reliable professional 4PL partner to manage your transport can make a profitable and efficient difference in the long run.



Artificial intelligence in logistics

The days of artificial intelligence being a reserve of science fiction are long gone. AI is steadily making its way into many aspects of logistics.

VEHICLES

Though driverless trucks and ships are expected a little further down the line, AI-assisted driving including assisted braking, lane-assist, and highway autopilot is already being applied to increase efficiency and safety. AI can monitor hundreds of sensors and is able to detect problems before they affect the vehicle in operation.



TRAFFIC

There are projects exploring the possibility of making traffic management systems more dynamic and responsive through the use of AI. AI algorithms will be able to predict changes in traffic enabling metropolitan mobility managers to make faster and more informed decisions on signal timing, suggested routing, and capacity allocation.



PREDICTIVE REPORTING

By processing historical data to predict likely future activity, companies can begin to make more accurate shipment predictions and increase visibility in their supply chains. Importantly, AI can enable companies to get notifications if a delivery is deviating from the plan, giving them time to make adjustments.

BUSINESS PROCESSES

Many resource-heavy manual and repetitive business processes in e.g. finance, procurement, training, and human resources are being replaced by software robotics. AI can help Robotic Process Automation (RPA) learn from human decisions and make better ones by blending the rule-based systems of RPA with the dynamic learning of AI.

WAREHOUSES

Using historical data and forecasts, AI will enable automatic sorting, counting, moving and other activities in warehouses. With visual perception, robots will be better able to manoeuvre the warehouse space, which will increase the number of tasks that can be automated.

CUSTOMS

With AI's self-learning capabilities, language processing and visual perception, it will be able to process customs documents quickly and automatically. The complexity of customs declaration means that human involvement will always be necessary, but to a lesser extent.

The **largest** cargo **aircraft** in the world is the Antonov An-225 Mriya, which can take off with a maximum weight of **640 tonnes**



(Source: Antonov Airlines)



The first air cargo flight

took place in 1910 when a Wright Model B aircraft flew 105 km (65 miles) to deliver 91 kg (200 pounds) of silk from Dayton to Columbus, USA.

Mine your data **Find your gold**

Your supply chain reporting needs to show you more than just how well things are running. It also needs to show you where you can improve.





The ability to understand the minutiae of a supply chain is proving invaluable as pressure from customers to get things right is escalating – whether those customers are B2B or B2C. We expect goods to be delivered faster, more flexibly, and at an ever-lower cost. The result is a critical need to optimise supply chains – constantly.

Just a few years ago, even large companies relied on gut-feeling rather than facts to make important decisions regarding their supply chains. In fact, many still do. The difference between then and now is that in the past there was plenty of data and all the right ideas, but so much time went into mapping the data and correlating endless spreadsheets that getting to the next stage of insight was difficult. Loads of data, but not so many conclusions.

Now however, technology can do more of the heavy data lifting, giving analysts more time to unearth and make use of insights. This has given businesses the opportunity to go from being reactive (this is what happened) to being proactive (we can make this happen).

UNCOVER THE GOLD

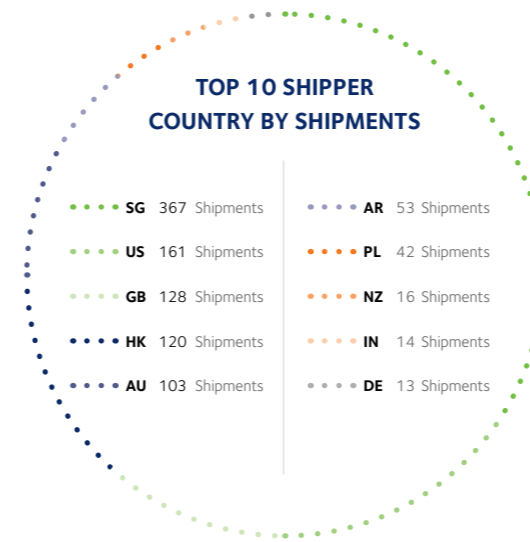
Firstly, the supply chain reporting setup should match the size of the supply chain, so some companies will do just fine with basic data sets and graphs, while others

who employ an international network of trade lanes and varying shipment modes may benefit from an advanced dashboard.

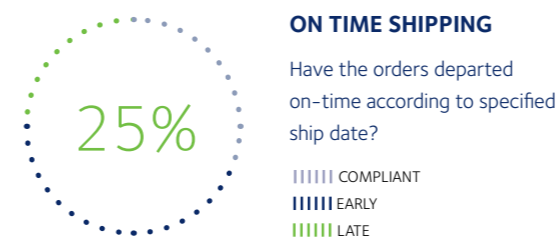
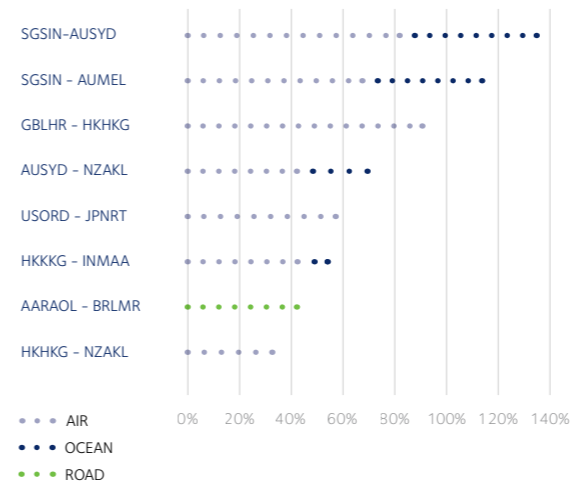
Finding the gold in your performance data means getting beyond the basics. You of course need to know that orders are received in the right quantity and at the agreed-upon time. But with a complex network, a top list of best and worst performing trade lanes in terms of lead time may reveal where your supply chains need to improve. And by relating the figures to market data, you may even get an idea of whether you are performing better or worse than your competitors.

It is all about putting your supply chains' performance into perspective. Companies that outsource parts of their supply chain may benefit from reporting that presents the median and the distribution of transit times per trade lane and transport mode to identify reliability and variability. You can use the insights for better just-in-time planning purposes, to agree on realistic performance targets, and to actively target the sources of variability – and ways to address them. And maybe a top 10 of the best performing suppliers can give you an idea of which ones to increase or decrease your business with. The point is that by relating insights to each other, patterns and trends emerge that become nuggets of gold in the search for improvements.

EXAMPLES OF REPORTING GRAPHICS



TOP 10 TRADE LANES BY SHIPMENT



ANALYSIS PARALYSIS

But with more choices of metrics and the ability to relate them to each other, you also run the risk of over-complicating things. You need to prioritise and summarise your figures, or it can lead to what some call 'paralysis by analysis.' That is when overanalysing a situation causes decision-making to become paralysed – meaning that nothing gets decided, let alone implemented. It's a dynamic you may recognise from when you keep scrolling through Netflix to find the right movie – and end up choosing nothing.

The ability to keep things simple, when they are in fact complex, is critical to logistics reporting. Playing a key role in that is the visual presentation which can help users find what requires their attention. For example, a traffic light system – green, yellow, red – can immediately draw attention to critical developments, while graphs and curves can make trends easily decipherable.

As your supply chain becomes more complex with today's increasing demands, you need a reporting system that easily tells the story of your performance, and by always knowing where you need to improve, you can make the right decisions about your supply chain.

The next phase of 3D printing

The raw materials used in 3D printers are now so refined they are accelerating the advancement of 3D printing technology.

3D printing technology has developed incredibly swiftly over the past decade. Whereas before it might have cost upwards of €1 million for an average model, you can now purchase a cheap 3D printer that can produce surprisingly good results for a few thousand euros. At the same time, the ingredients, or raw materials, that go into the printer have become a game-changer for the technology.

Plastics, metals, ceramics, and composite materials are examples of the ingredients that a 3D printer needs to create an output. Since more and more companies see the value of using 3D printers in their supply chain, the development of the raw materials industry has accelerated. With improved raw materials come ever more possibilities for 3D printing.



Insight provided by Erik van Wunnik
Director Product Development, DSV Solutions



Spending on 3D printing worldwide in 2018, 2019 and 2022¹

Market size in billion U.S dollars.
* Numbers are projected

(Source: Statista)



The new raw materials are stronger, more corrosion resistant, weather resistant, can take more heat, are more flexible, detailed and have better feature resolution. They create possibilities for more varied design, colours, durability, and biodegradable production, and that means a lot more functional possibilities for practically any industry. From automobile manufacturers using 3D printed parts that save fuel by weighing less than their fake counterparts, to Nike printing lightweight cleats for shoes – the opportunities are plentiful.

An example from our own world at DSV is a customer that uses 3D printers to produce

plastics for manufacturing purposes. After changing its recipe (i.e. the model used to 3D print), and using an upgraded type of raw material, their 3D printed plastics are now certified for use in the food industry – opening up more possibilities for the company. In short, using better raw materials can open up more doors for 3D printing.

With refined raw materials and costs continuing to decline, 3D printing is entering a phase that could take it from being just a talked about piece of technology to be an essential component in logistics.

“ In short, more 3D printing business cases are starting to make sense. ”

Erik van Wunnik

An overlooked hurdle to unfolding predictive analytics



Predictive Analytics is about using data to spot patterns and act accordingly. Your organisation is probably on top of data collecting and crunching – but if you don't also take the change management part seriously, it can put the brakes on your project.

Success in the logistics industry is dependent on the ability to manage time and resources well, which is why investments in new ways to gain a competitive edge have been abundant. Predictive analytics is one of those ways, and while it is already making a difference for companies such as Amazon, Tesla, and Netflix, there are still huge steps to take, and gains to be made, for logistics.

A study by the Council of Supply Chain Management Professionals shows that more than 90% of shippers and third-party logistics firms believe that data-driven decision-making is vital to supply chain activities.¹ Areas of logistics that have been, or will be changed include inventory management, ETA calculations and reporting.

TRUST ISSUES

Creating a great analytics model requires understanding the business it concerns, finding and cleaning data, predictive modelling and testing. Once a model has been built, the data scientists will understandably be in the mood for celebration. But that may be premature – because at this point another big challenge begins.

In order to benefit from your data analytics, you need to make the model useful to the organisation. That requires building a sustainable process around the model that people can work with – and indeed want to work with. Even more important is the commitment from the top of the organisation to commit to the project. Incidentally, a recent study asked CEOs about their concerns about adopting





PREDICTIVE ANALYTICS —

artificial intelligence in their organisations – and more than 76% cited increased vulnerability, disruption to business, potential for biases and lack of transparency as key concerns.²

The challenge of changing behaviour was no less great when DSV applied predictive analytics to improving the customer experience.

PREDICTING CUSTOMER DEFECTION

At DSV we use predictive analytics to predict when certain segments of our customers are considering leaving us. It enables us to find out if there are areas that we can improve upon so that the customers choose to stay.

We started creating the model by gathering data from key sources – finance, claims, transport management systems, bookings and more – and then, like the ingredients in a dish, we cleaned and parsed the data. By analysing and correlating the data and testing vigorously over many weeks we built the model from 74 different variables using XGBoost Trees (a type of algorithm). When the model had reached a high level of accuracy in its predictions, the challenge of creating a real change in behaviour began.

The predictive model sends a ‘warning’ (with more than 85% accuracy) to account managers that a customer is dissatisfied or

considers leaving. Convincing account managers that they should trust the forecast was the first big ‘change’ step. That meant showcasing the predictive model and the forecast to the organisation over and over again and getting people to use it in their daily work.

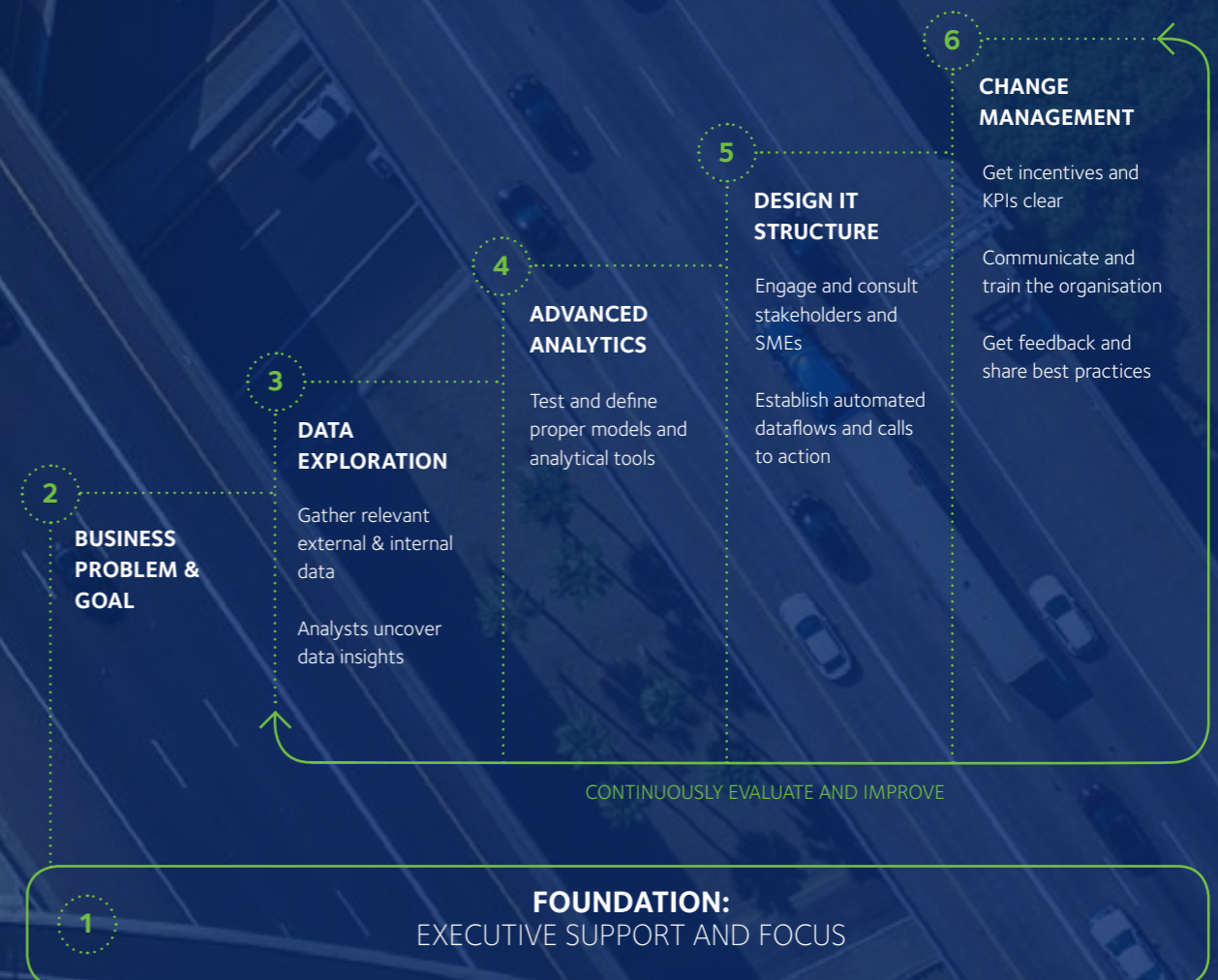
We did it by teaming up with four pilot countries in our organisation who received weekly predictions manually during the first year. The aim was to get solid proof that the concept worked and then show the rest of the DSV that defection forecast was worth the effort. The pilots showed a combined improvement in customer retention of around 20% and a good increase in turnover from retained customers. We had our proof.

Today, the model is an effective and automatic tool widely used in DSV – but by no means without limitations. Success of DSV’s customer defection forecast is 20% due to data analysis and advanced analytics and 80% because of the people and culture that use the results to improve the experience for our customers. So, to ensure your organisation gets the most out of your predictive analytics, be prepared to push for change.

Insight provided by **Pia Elmue**
Senior Product Manager, Customer Analytics, DSV Panalpina



Successful deployment of machine learning and advanced analytics requires getting all six elements right



(Source: Pia Elmue)



The pillars of seamless e-fulfilment

To create a seamless e-fulfilment experience that delivers on the demands and expectations of today's customers, you'll need a unified system and the data flow to support it.

E-commerce sales are expected to continue skyrocketing over the next few years, with a recent projection suggesting they will reach up to \$4.9 trillion worldwide in 2021 from a projected \$3.5 trillion in 2019. The projection adds that e-commerce, at its current trajectory, will have a 17.5% share of all retail sales in the world by 2021.¹

One consequence is that the lines between online and "bricks and mortar" shopping behaviour will continue to be blurred, and shoppers will increasingly use multiple channels to buy what they need and want. A recent study showed that 74% of US consumers on occasion make purchases online after seeing the product at a retail store while 15% do it regularly.²

Multichannel fulfilment is firstly about understanding customers' behaviour – what, where, when, why and how they purchase products. Secondly, it is about creating a system that makes the shopping experience seamless.

THE CUSTOMER IS KING 2.0

You are buying shoes online. You find the right pair, but you want to try them on at the store. You go to the store, try the shoes on and buy them – but later you regret your decision as the colour is not quite right. So, you send the shoes back after having made a returns case on their website.

All those steps are expected by the customer to go smoothly. If they're told on the website that a certain size is available, they will be disappointed to find that size out of stock when visiting the store. If they can't use the website or app for returning the shoes, or if they contact your customer service and don't get the right information – you may never see that customer again.

The adage of the customer being king is doubly true now. They know what they want, and they know when they want it. Any mistakes will not be quickly forgiven.

CLARIFYING COMPLEXITY

A large part of the multichannel fulfilment exercise is about managing data. You start the process of breaking down the complexity by analysing the data flows to and from

your channels to your content management systems (such as your customer service system). The key to a seamless solution has two main components:

1. One single database

Having just one database that all employees involved in fulfilment use and draw data from is crucial. If Customer Service looks at one system, while Logistics looks at another, the end customer will likely experience discrepancies between what they are told. You need a single point of entry.

2. Connection between data base and channels

The data flow from the main database to sales channels, e.g. the shopping app, needs to be precise and to have no latency in both directions. Order handling, delivery, financial transaction, marketing reporting as well as

any other fulfilment elements all need to be connected.

WHAT DOES YOUR CUSTOMER SEE?

Many sales-driven companies are great at strategy, planning, building as well as promoting their products and services but forget two crucial elements in the customer experience: delivery and care. It's those two key elements can make or break a customer's experience with that company.

It all comes down to integrating the entirety of your supply chain into one strong front end. You may have multiple procedures, priorities, interests, systems and suppliers, but what the customer should see is one unified company that provides a pleasant shopping experience.

Integrating all your supply chain elements into one strong front end

YOUR CUSTOMER SEES ONE BRAND



BUT IN REALITY YOU HAVE MULTIPLE

- Procedures
- Priorities
- Interests
- Systems
- Suppliers

DID YOU KNOW? —

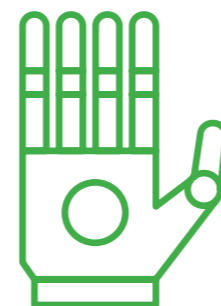
The biggest **warehouse** in the world is the Boeing Everett Factory in Washington, USA, which measures **400,000 m²**

3

That's about 3 times the size of Alcatraz Island.

(Source: Wikipedia.org)

The global size of the market for **industrial robots**



is projected to reach **\$73.5 billion** in 2023 – up from \$33.1 billion in 2016.

Brokerage boom

Q&A The emergence of digital freight brokerage platforms is a trend predicted to increase in the coming years. How does a traditional freight forwarder like DSV view this development? Group Chief Information Officer Jesper Riis weighs in.

In recent years, a growing number of start-ups have eyed-up the road freight brokerage process aiming to simplify what is a rather complex system through digital interfaces. A recent study projects the digital freight brokerage market to reach \$54.2 billion by 2025.¹

Q: What do these digital freight brokers offer?

Jesper Riis: They essentially offer platforms, usually apps, that match shipper demand (the need to transport a product) with carrier supply (truck capacity). Advanced algorithms then match carriers and loads based on origin, load type, price, timing, and destination. A little bit like what hotel portals do in the hotel industry or what flight portals do for passenger flight booking, digital freight brokers try to aggregate forwarders and carriers to ease freight booking.

Q: What are your first thoughts about their emergence?

JR: Well, it's a complex market, and we work with many of them actually. For instance, we put cargo up on freight exchanges which are one type of digital brokerage platform. We also develop our own solutions to supply the demand that there is. But of course, it's a development and a market that we monitor closely because some of them compete with us.

“ They're a bit like the proverbial swan, their front pages look great above the water, but behind them – below the surface – run a lot of manual processes. ”

Q: From what I understand there are several players in the field, doing broadly different things.

JR: Exactly. The market is extremely fragmented, but they can roughly be categorised into groups of freight exchanges, tool providers, and digital resellers *(see

visualisation). As I said, we use freight exchanges to move excess cargo particularly in Europe. Tool providers usually don't engage with freight forwarders like DSV directly. Instead they will convince the shipper that the shipper will benefit from using their platform. If a tool provider becomes very big and takes over the commercial





responsibility, they, in effect, become a digital reseller which competes more directly with DSV. As for digital resellers, they essentially act as freight forwarders alongside established forwarders. The primary difference is that digital resellers' main service offering is the connection to a customer.

Q: So how disruptive are these start-ups to the industry, really?

JR: It is important to remember that even though many of them get a good amount of capital to develop their ideas, they still have a long way to go to create the proper efficiency in the backend to sustain a profitable business. They're a bit like the proverbial swan, their front pages look great above the water, but behind them – below the surface – run a lot of manual processes. And, as they're so young, if things do not go as planned for their users, then their support systems are not yet at a point where they can deliver the type of customer service that the traditional players offer their customers.

Q: The new platforms have gained momentum because they offer fast booking speed, a user-friendly pricing and bidding functionality, and visibility of shipments. Is that something traditional freight forwarders can learn from?

JR: Absolutely. We can't deny that they've illuminated a need among our customer base, and it's something we've also addressed. For example, we have developed myDSV which is a modern, easy-to-use, and fast booking platform that offers visibility for our customers and was developed alongside our customers. We are expanding its functionality all the time to match the needs of the market.

Q: What does the future hold for digital platforms?

JR: Digital platforms will undoubtedly become more advanced in the future – in logistics and everywhere else – as data and data crunching becomes faster and more extensive. Algorithms will become more advanced, and we will be able to more precisely estimate time of arrival for shipments, for example. Every player in this industry, including us, must stay on top of this digital development to give our customers the best possible experience.

Insight provided by **Jesper Riis**
Group Chief Information Officer, DSV Panalpina



FREIGHT EXCHANGES

Freight Exchanges connect freight forwarders or carriers with cargo to freight forwarders or carriers with excess capacity. The two parties agree outside the freight exchange to perform the services and at what rate. The freight exchange does not hold any commercial relationship to the shipper of the goods and focuses primarily on the matching of cargo with capacity.



TOOL PROVIDERS

Tool providers focus on how they can help the shipper optimise their supply chain. For example, they may offer a web-based platform that allows the shipper to overview their engagements with various freight forwarders and carriers, as well as track the status and location of all their shipments across freight forwarding companies and trade lanes.

Tool providers generally convince the shipper that the shipper will benefit from using their platform. In turn, the shipper will require freight forwarders to integrate with the Tool Provider platform as a precondition of doing business.



DIGITAL RESELLERS

Digital resellers essentially act as freight forwarders alongside established forwarders, but they usually do not offer any other service besides the connection to a customer. In their platforms they invite e.g. DSV to make quotes for transport between A and B for signed up customers X, Y, Z to pick and choose from. The digital resellers own the customer relationship with the customer which relegates the freight forwarder to only perform the transportation.



Supply chain segmentation starts with a C

Supply chain segmentation is about matching what your customers want with how your supply chain is put together. To do it right, you first need to know your customers well.

It's a bit like a doctor who gets the diagnosis wrong – no matter how well he performs the subsequent operation he will not cure the patient. If you don't start your supply chain segmentation by correctly analysing your customers' needs and wants, you are likely to end up with a supply chain design that over-serves some customers while under-servicing others.

Let's look at a fictitious company we'll call The Fashion Retailer. The company sells men's black socks and women's summer dresses. They have basic and luxury lines for each of their product categories, and they sell through different on and offline channels. The Fashion Retailer needs to match the right supply chain performance attributes to the requirements of its customers.

Step 1: UNDERSTAND CUSTOMER DEMAND

The first step in the supply chain segmentation journey is to understand the demand as well as the supply side. The main differences in our example of men's black socks and women's summer dresses can be summarised as follows:

PRODUCT	MEN'S BLACK SOCKS	WOMEN'S SUMMER DRESSES
DEMAND	<ul style="list-style-type: none"> • Low demand variability • High demand predictability • Low variety/SKU count • Low price and low margin • Never out of stock/replenishment • Long shelf life 	<ul style="list-style-type: none"> • High demand variability • Low demand predictability • High variety/SKU count • High price and high margin • Replenishment only if the product sells • Short shelf life
SUPPLY	100% make-to-stock	Initial launch make-to-stock Replenishments (if any) on make-to-order basis

As you can see, The Fashion Retailer's two product categories have quite different demand and supply characteristics, and they therefore require different supply chains with different capabilities and supply chain metrics.

Step 2: ASSIGN PERFORMANCE ATTRIBUTES

The next step is to assign the right supply chain performance attributes to each supply chain. Before we do that, let's take a closer look at the main ones (SCOR metrics)¹:

	ATTRIBUTE	STRATEGY
CUSTOMER	(RL) RELIABILITY	Consistently getting the orders right, product meets quality requirements
	(RS) RESPONSIVENESS	The consistent speed of providing products/services to customers
	(AG) AGILITY	The ability to respond to changes in the market (external influencers)
INTERNAL	(CO) COST	The cost associated with managing and operating the supply chain
	(AM) ASSETS	The effectiveness in managing the supply chain's assets in support fulfillment

The most important performance attributes for The Fashion Retailer's line of men's black socks are reliability and low cost, driven by the ability to forecast demand easily, and the requirement to remain competitive for a low margin product by keeping costs down.

The capabilities required for the supply chain for a high margin women's dress with a high degree of unpredictability and short seasonal demand are quite different. If you want an agile supply chain, where you can increase or decrease your supply quantities very quickly, you need the shortest possible lead time. This will have huge implications on where you source, transport, and store your products.

Each of The Fashion Retailer's supply chain designs will have different capabilities and different price points. In other words, your segmentation should be driven by each value proposition that you offer your cus-

tomers for each product. And your supply chains need to be aligned to these value propositions.

Step 3: APPLY NEW PRIORITIES

A thorough analysis will lead you to a set of priorities that need to be applied to each of your supply chains. This includes a wide variety of variables such as the amount of revenue that each product generates.

Segmentation will help you to reduce complexity in your supply chains, and there are strong opportunities for finding synergies by leveraging volume across segments to reduce costs.

Network design is becoming easier with new tools that crunch variables faster than ever before. But if you don't examine what your customers require from your supply chains correctly at the outset, then you won't cure the patient.

Political steps important to faster green transition

Comment With transport being one of the most carbon-intensive activities, individuals and businesses are increasingly seeking more and faster change. Speeding up the sector's transition towards greener alternatives is a shared responsibility that needs to include political steps.

If you had been cryogenically frozen in 1990 and woke up again today, you might wonder what all the fuss about climate change is about. Back then you probably weren't too bothered about your new jeans having an environmental footprint.

Today, human-driven environmental impact is a growing concern, and so is the desire for action. A 2019 survey from the UK said that 80% of respondents were 'fairly' or 'very' concerned about climate change – a rise from 74% in 2018.¹ A study from the US showed that 72% of respondents deem global warming 'personally important'. The surge in concern, said the study, is mostly down to natural disasters such as hurricanes, melting glaciers, and heat-fuelled wildfires bringing climate change closer to home.²

Transport has a significant impact on the environment as a major consumer of energy. Most vehicles and aircrafts emit CO₂ –

one of the most harmful greenhouse gases. Movement towards lower emissions is happening in both transportation of people and transportation of goods. But slowly.

IMMEDIATE VS. LONG-TERM CONCERNS

For logistics, the complexity and cost of altering supply chains are barriers to faster results. For example, a lot of companies focus on reducing capital they have tied up in stock. So instead of buying 10,000 pairs of jeans, moving them by sea transport and storing them in a warehouse (make-to-stock), a company will calculate precisely how many they will sell week by week and plan their manufacturing and transports accordingly (make-to-order). That behaviour can lead to more frequent use of air transport – with a higher CO₂ cost. On the other hand, some of the 10,000 jeans made-to-stock might never be sold and end up being destroyed. This is also negative for the environment and illustrates that air trans-





port sometimes can be the right choice for the environment.

At the same time, companies are under pressure to drive down costs while still maintaining high service levels for increasingly demanding consumers, and so far, that has outweighed concerns for the environment. Consumers are now also demanding environmentally responsible behaviour from the companies they purchase from – and not just low prices, same-day deliveries and endless choices.³ That is why many companies have started to integrate sustainability into their overall strategies – not just out of concern for their reputation, but also to reduce waste and energy consumption. This is where long- and short-term concerns begin to align.

Consumers also feel the struggle between immediate needs and long-term concerns when they have the option to pay extra for environmentally 'safe' products in the supermarket or when they chose modes of transportation. Sacrifices need to be made by both consumers and companies, but they also need to be facilitated by political action.

LEVEL PLAYING FIELD

The green transition is a shared responsibility, but it is difficult to imagine a company making big investments for the environment that its competitors are not making. That's why political frameworks incentivising all the players in an industry to choose green

solutions is needed. It could include subsidies for companies that choose environmentally friendly ways of operating, tax breaks, incentives to support investments in green technology, or making infrastructure decisions that accommodate sustainability.

Studies show that incentives work. Data from the European Environment Agency, for instance, shows that emissions of CO₂ from new passenger cars have dropped in several European countries where a range of tax breaks, subsidies and other incentives have been used towards consumers.⁴ If we, in the same way, want logistics companies to make the right green choices, similar political steps are needed.

A good example of potentially effective action is the International Maritime Organisation's ruling that from 1 January 2020, marine sector emissions in international waters must be lowered significantly. The regulation means that sulphur content in all marine fuels must be limited from the current 3.5% to 0.5%. The marine sector is responsible for half of global fuel oil demand.⁵

There are no signs indicating that the rise in awareness and concern for the environment is stopping, so it makes sense for businesses to incorporate greener alternatives into their strategies. A critical component for better green results, however, are strong political steps that reach across borders and industries.

New investments in clean energy worldwide from 2004 to 2018, by major region (in billion U.S. dollars)⁶



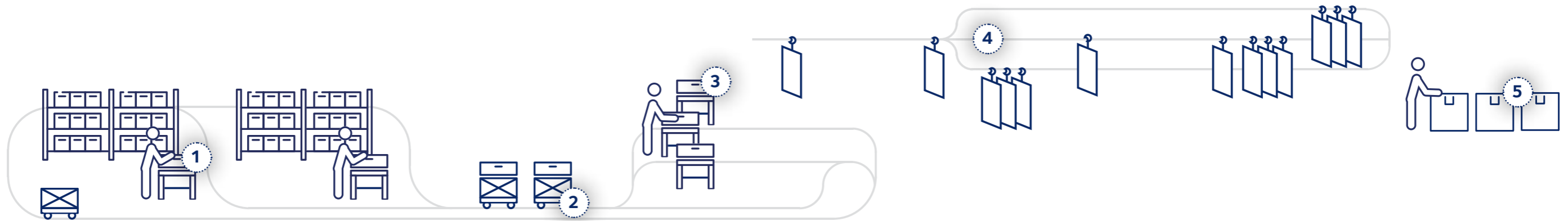
(Source: Statista)

Wired co-workers

Case story Automation and robotics have become an integral part of DSV’s business at its warehouse facility just outside Toronto in Canada.

The challenge two years ago was how to deal with explosive growth in DSV’s large 3PL e-commerce business for consumer goods. It was clear that the additional demand and congestion in the warehouse would not be an efficient long-term solution.

On average, the warehouse had 600 people pick-packing orders in a process with a high degree of complexity and speed. Orders had a random nature to them, which made it difficult to predict and plan for an efficient slotting of inventory in the warehouse – a situation that was compounded by the forecasted growth rate



1. BATCH PICKING

Pickers collect items in totes and place them in automated guided vehicles (AGVs).

2. TRANSPORT BY AGV

AGVs transport the totes to the induction stations using tracks in the warehouse floor.

3. SCANNING AT INDUCTION STATION

Workers scan each item and induct them into individual pouches.

4. AUTOMATED SORTING

Pouches are placed in a carrier system that where they are sorted and sequenced by order.

5. PACKING

The sorted pouches are transported to the packing stations where orders are finalised and shipped to customers.



DATA-DRIVEN SOLUTION

“We had to step back from the challenges to see the solutions for the future. When we did that, we found that even within the randomness, there was a pattern in the data that emerged,” says Rob Chanona, Managing Director of DSV Solutions in Canada.

“To determine the best solution, we relied on data, experience and our knowledge of

the expected future growth of our customer. Taking all this together helped us build visibility and bring value to our customers”, notes Chanona, who oversaw the project.

TECH-SAVVY TEAMWORK

The road to a tech-savvy solution brought together DSV’s team with technology suppliers to determine the best possible solutions based on proven data.



It was important for us to let the data lead the way, rather than our preconceived notions

Rob Chanona



“It was important for us to let the data lead the way, rather than our preconceived notions,” says Chanona. “We got excellent insight into the buying patterns of customers from the historical data, and that then enabled us to predict capacity requirements several years into the future.”

Where data defined the path, the team developed an implementation plan that best suited the facility. The engineering team analysed the human factors such as walking patterns, time usage and other processes in the warehouse to find the best-fit technology that could support the new growth in an existing footprint.

WORKING WITH ROBOTS

To create synergies between its people, work flow and automated processes, DSV went after employee engagement as a key part of the implementation. “When our people saw the benefits first-hand, they understood how the new automated robotics could help us work both smarter and more efficiently,” says Chanona.

Ultimately, DSV decided to implement a balanced system of twenty automated guided vehicles (AGVs) to autonomously transport batch-picked orders along the warehouse floor to various hi-tech induction stations. Orders are then scanned by operators and placed into an overhead carrier pouch system, where they are sorted autonomously and sent to pack-out stations where they are completed for shipment to customers.

Previously, human operators used to pick directly from shelves and take items to packing stations. Now, time is saved by having robots do the transport to those stations.

THE ONLY CONSTANT IS CHANGE

E-commerce is a fast-moving business,

where fluctuations and seasonal volume changes are inherent. Managing constant change with a future-state vision was key to success.

“The implementation required a lot of change management. We had a large group of people that needed to get used to working in a new way, and everyone knew that one objective was to decrease labour. I was hugely impressed with how the staff went through the transition period,” says Chanona.

“What started as a huge challenge brought the team together to embrace the change and collaborate with ideas and experiences. New ways of working created excitement, and I believe that this new high-tech environment is a much cooler place to work,” adds Chanona.

The result for DSV’s warehouse facility was greater efficiency and resilience to changes in customer needs and growth – where workers and automation now work hand-in-hand as partners. Just as valuable, though, are the experiences that DSV learns from this operation that we can use in our many other warehouses going forward.



What happens to your cargo?

1 SHIPPER

Once we have your booking, we collect your cargo and it starts its journey.

2 EXPORT HAULAGE

We take it to our handling terminal, usually by truck, rail or a combination of the two.

3 EXPORT TERMINAL

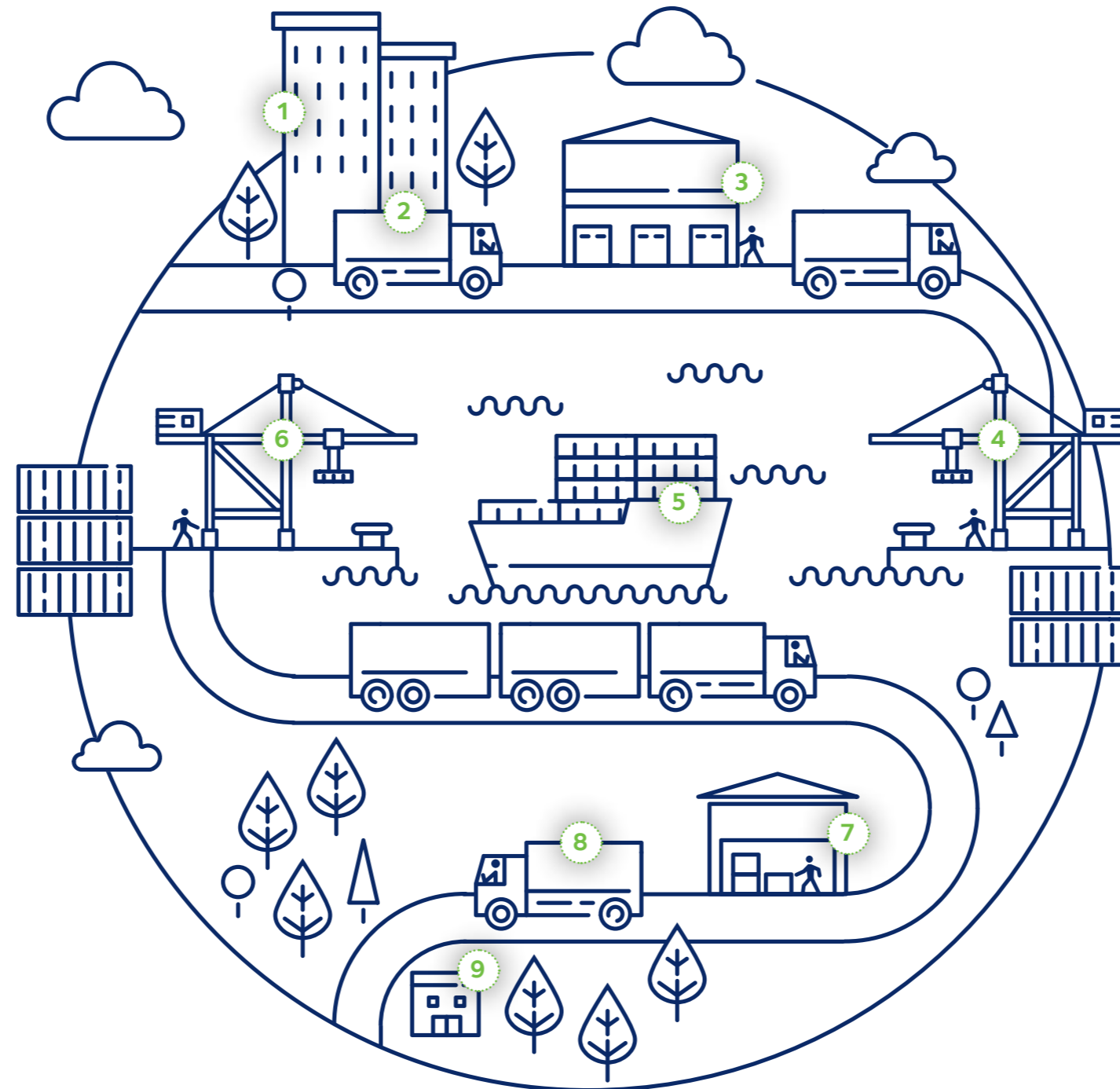
We consolidate your cargo into containers ready for export.

4 ORIGIN PORT

The cargo arrives at the port of loading. We handle export customs clearance here by preparing and submitting your documentation to the customs authorities. Once the customs have approved the export, the container is sealed and loaded onto the ship.

5 AT SEA

The cargo is shipped to the destination port. On long sea routes, most ships call at several ports on the way to drop off and pick up more containers. While the ship is at sea, we as freight forwarder, or a customs broker, prepare the required import documents and submit them to the customs authorities at the destination port.



6 DESTINATION PORT

The container is unloaded by crane and then a forklift will move it to a secure area where the actual customs clearance procedure takes place. If the customs authorities want to examine the goods, the customs seal may be opened, the container opened, and the products checked. Sometimes this procedure takes place using x-ray equipment.

Local customs ensure that duties, taxes, and any fees related to international traffic and trade are paid. Port officers can also inspect cargo to protect the destination country from animal and plant diseases.

7 DESTINATION TERMINAL

The cargo is transported from the port to the destination terminal where the container is unloaded and your goods prepared for the last leg of their journey to you.

8 IMPORT HAULAGE

Your cargo is transported to the consignee.

9 CONSIGNEE

Our work is complete, and your cargo has been delivered..

10 ways to reduce transportation costs

A good reason to engage a lead logistics (or fourth-party logistics) provider is that they know how to find ways to keep reducing transportation costs.

The ten focus areas that we have compiled here are based on our work at DSV Lead Logistics. In our North American and European organisations, we have skilled people who use advanced tools to design, manage and improve intelligent supply chain solutions.

1. OPTIMISE YOUR NETWORK DESIGN

The performance of a supply chain depends on its design. Your goal is to create the most efficient means of moving your products and at the same time maintain your desired service level. Important decisions are related to the basic set-up of the network, such as who is paying for and organising transportation (Incoterms®) and the use of cross dock locations and pool points.

2. SOURCE THE RIGHT CARRIERS

Finding the right carriers for your supply chain flows and securing the most favourable conditions can save you costs. Important factors include transport market intelligence, the sourcing strategy, and procurement capabilities. The use of a logistics procurement tool by trained professionals, for instance, enables you to initiate bids along single and bundled lanes, analyse bid responses (also scenario based) and facilitate multiple bidding and negotiation rounds.

3. SELECT THE RIGHT TRANSPORT MODES

You need to select the transport modes you use in your supply chain for each shipment properly. This is about having the right business rules in place for basic transport mode selection (road, air, sea, train or intermodal) and the trade-off between transport modes (e.g. less than truckload vs. full truckload). Reduction of premium freight while respecting service levels should also be considered.

4. CONSOLIDATE SHIPMENTS

You can reduce costs by fully utilising the capacity of your transport equipment, e.g. by combining multiple orders for the same customer, or creating milk runs by picking up goods from multiple origins and/or delivering to multiple destinations. Extension of time windows and aligning pick-up and delivery schedules will increase the possibilities to consolidate shipments. Also, collaboration with other shippers could be considered.



5. CHOSE THE RIGHT EQUIPMENT

The type of equipment you use for a specific shipment has an impact on your costs. There are many different types of trucks, containers, trailers and other equipment such as stand-drop trailers, mega volume trailers, double trailers and light trucks.

6. OPTIMISE CONTAINER, PALLET AND LOAD DESIGN

The number of products and orders that fit in a truck or container is determined by packaging, pallet builds and load builds. Optimising packaging and pallet builds while taking your transportation needs into consideration should be discussed with your supply chain partners. Dedicated tools can assist in calculating the optimal positioning of goods in a truck or container.

7. OPTIMISE TRIP PLANNING

You need to plan in detail the optimal trips that occur within your network. Your optimisation efforts could include direct deliveries, pool point shipping and/or back-hauling. Also, combining regular shipments with return shipments can reduce your transportation costs.

8. SELECT THE RIGHT CARRIERS

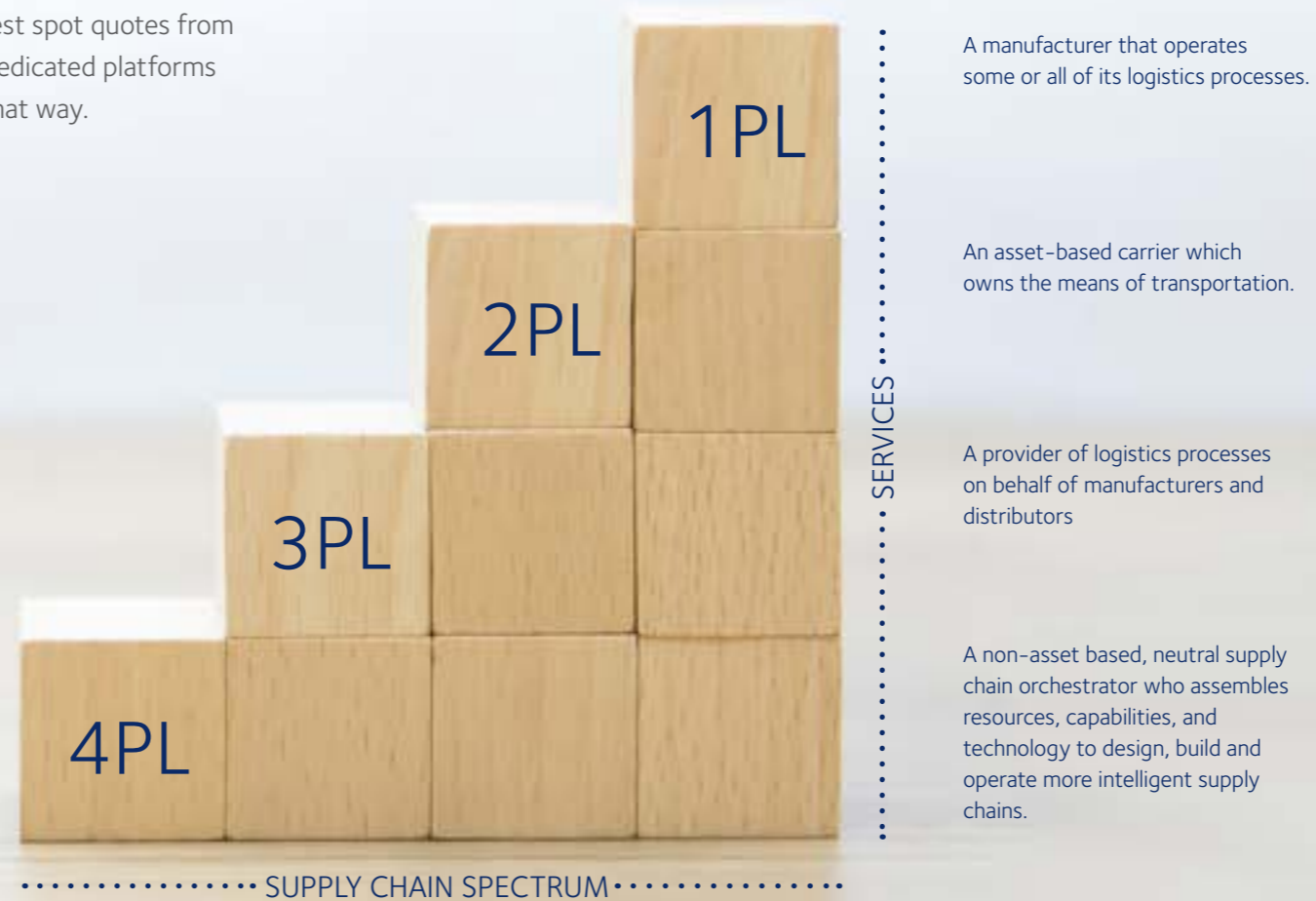
You may have contracted multiple carriers for the same lane, so your choice of carrier can have an impact on your costs. If you have not contracted any carrier for a specific lane, or your current carriers have no capacity, you can request spot quotes from various carriers using dedicated platforms and optimise costs in that way.

9. AUDIT YOUR CARRIER COSTS

Properly auditing your carriers means you can make sure that invoiced costs are in line with agreed costs for the various shipments. Your attention should especially be focused on application of the correct rates, on service failures, and invoicing of ancillary charges and fees.

10. MAKE SURE CARRIERS DELIVER AS AGREED

You need to make sure that your carriers comply with your agreements and deliver the quality and service they have promised. The costs and performance of each individual carrier need to be monitored and discussed during business review meetings, and improvement actions should be agreed upon to save costs in the future.





Phishing for weak spots ↴

If security is only as strong as the weakest link - consider emails a potential Trojan Horse. That's why smart companies are investing in awareness training. The first line of defence.

In transport and logistics, emails are a central communication channel, and studies show that the number of emails flowing in and out of companies will continue to rise despite the arrival of several new communication channels.

While most fraudulent emails are caught by the finely-masked security systems, many still get through – and the days of easy-to-spot phishing emails from Nigerian princes are over. Today, fraudulent emails can look like they came from a trusted colleague, client or even your bank.

With studies showing that 10% of phishing emails that make it to inboxes are opened – and links clicked – the risk of a breach is undeniable.¹

PAYING ATTENTION PAYS

Having your data hacked can be costly. Just ask Maersk (their hacking experience in 2017 allegedly cost them between \$200-300 million). That's why ensuring your employees can spot what is fake is essential in avoiding phishing or malware attacks.

One of the ways phishing emails can be spotted is by looking at details like the sender's email address (if your bank is yourbank.com, and the email comes from

yourbank.com, beware), the call to action (e.g. "send us money to this account"), or the general spelling and visuals. Being vigilant for anything out of the ordinary, even from people you know, is important. Training your employees to notice these details will help your team avoid a worst-case scenario.

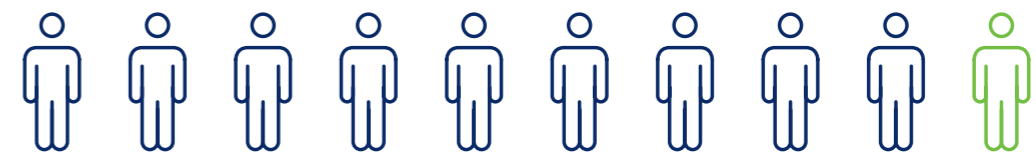
"I WOULD NEVER FALL FOR THAT"

The best way to ensure your team knows what to look for is through experience. That's why many companies have begun to conduct A/B testing where a fake phishing email is created and sent to two groups of employees: a group that has received IT security training, and a group that has

not. If the number of people opening your fake phishing email, and clicking on the link inside, is the same in both groups, you may need to retrain the first team – or review your training material.

Besides training and testing, your technical setup will help you filter out spam and phishing emails to minimise the risk. Large cloud-based solutions have shown to help many SMEs take large steps towards a safe email environment. Finally, it is impossible to completely avoid successful phishing attacks, and companies must enforce additional security measures. One example being multi factor authentication for user logins which contributes greatly to an improved security level.

10% of phishing email recipients open the email²



14,500,000,000



14.5 billion spam emails are sent every single day³

90%

of phishing happens via email¹

Inventory optimisation is basically a balancing act



Balancing service and inventory stock levels requires analysing the movement patterns of your stock items, classifying the items and using your data to make more accurate predictions.

Your children won't be happy if you run out of milk one morning. But on the other hand, keeping too much milk in the refrigerator means you are bound to throw some out now and again when it goes bad.

Finding this harmony is the everyday concern of supply chain managers who want to strike the right balance in their inventory levels. Their two main goals are to increase

stock rotation (avoid high inventory levels) and to optimise stock availability (make sure they always have stock to supply their customers). Achieving a stable relationship between working capital, operational costs and the perfect service level can make the difference between a making a profit and making a loss.

These days, having the right data available is a prerequisite for inventory management. Data analytics help you to see the big picture of your inventory, and thus make important adjustments in the details.



Step 1: DEMAND

It all begins with some hard business decisions regarding your products. Maybe you have had 'flops' in your product portfolio that need to be phased out or ordered as 'special' in your inventory. Maybe you have a 'cash cow' that needs a more prominent place in your stock strategy. This of course comes down to the performance of your products and your product strategy. In fashion for example, some items will sell steadily most of the year, while others are very seasonal.

To begin profiling your demand, take a look at your historical demand patterns and classify your articles based on those patterns. Your articles could be divided into normal, slow, regular or irregular demand. At the same time, your classification must include demand size per time internally, and demand size per customer order. The combination of these classifications provides the best prediction methodology for each individual article.

Step 2: FORECASTING

You need to choose the right forecasting method based on the article classification. It matters a great deal which of the proven methods you choose – such as exponential smoothing, moving average, autoregressive or Box-Jenkins. Your forecasting model should be able to automatically predict the vast majority of the Stock Keeping Units (SKUs) in your product portfolio automatically.

The prediction methods can be strengthened with qualitative information on marketing campaigns and planning to increase the forecasting accuracy. In addition, it is important to enrich the forecast data at a customer level during new product introductions and promotions. If your customer base consists of a few large companies, customer demand fluctuations have a significant influence on your planning. It is important to be able to adapt quickly to these changes.

Step 3: OPTIMISATION

The results of your forecasting analyses should be checked against your current inventory management process to find the right areas for optimisation. Your outcome could be a new inventory strategy for each item and each location that you have, ensuring you have a dynamic stock position and re-order level. After that, your focus should be to continually improve your

methods for classification and forecasting. As supply chains become more complex, so does inventory optimisation. Within the above basic steps lies a science of complexity that requires advanced software and the right experts in order for the whole business to master them. But once you strike the right inventory balance, you will see it in your bottom line.

INTRODUCTION.....

- 1 <https://www.imf.org/en/Publications/WEO/Issues/2019/10/01/world-economic-outlook-october-2019>
- 2 <https://www.prnewswire.com/news-releases/global-logistics-market-to-reach-us155-trillion-by-2023-research-report-published-by-transparency-market-research-597595561.html>
- 3 Transport Intelligence report: Total Logistics 2018
- 4 <http://reports.weforum.org/digital-transformation/understanding-the-impact-of-digitalization-on-society/>

REALTIME.....

- 1 <https://www.statista.com/statistics/294171/online-and-in-store-purchase-and-shipping-preference-north-america/>

TRADE

- 1 https://en.wikipedia.org/wiki/China%E2%80%93United_States_trade_war
- 2 <https://www.scmp.com/comment/opinion/article/3018712/us-china-trade-war-has-produced-more-losers-winners>
- 3 <https://www.reuters.com/article/us-best-buy-results-tariffs/best-buy-ceo-says-more-china-tariffs-will-impact-u-s-shoppers-idUSKCN1ST1GH>
- 4 <https://www.bloomberg.com/graphics/2019-new-economy-drivers-and-disrupters/vietnam.html>

DID YOU KNOW? “TRUCKS”.....

- 1 <https://www.statista.com/statistics/268157/ranking-of-the-20-countries-with-the-highest-road-quality/>
- 2 <https://www.dieselforum.org/news/new-technology-clean-diesel-trucks-with-near-zero-emissions-now-make-up-33-of-all-trucks-on-u-s-highways>

BLOCKCHAIN.....

- 1 <https://www.statista.com/statistics/647231/worldwide-blockchain-technology-market-size/>
- 2 <https://www.hyperledger.org/resources/publications/walmart-case-study>
- 3 <https://www.maritime-executive.com/article/new-jv-develops-blockchain-systems-for-port-of-shanghai>

ELECTRIFICATION

- 1 <https://qz.com/1620614/electric-car-forecasts-are-all-over-the-map/>
- 2 <https://www.statista.com/statistics/827460/global-car-sales-by-fuel-technology/>

START-UPS

- 1 <https://www.forbes.com/sites/neilpatel/2015/01/16/90-of-startups-will-fail-heres-what-you-need-to-know-about-the-10/#eac883766792>
- 2 <https://www.statista.com/statistics/882609/growth-startup-funding-by-industry/>

DID YOU KNOW? “AIRCRAFTS”.....

- 1 <https://gizmodo.com/the-worlds-largest-cargo-plane-can-swallow-a-737-whole-511093454>
- 2 <https://www.freightos.com/air-cargo-got-wright-9-incredible-air-cargo-facts/>

3D PRINTING.....

- 1 <https://www.statista.com/statistics/590113/worldwide-market-for-3d-printing/>

PREDICTIVE ANALYTICS

- 1 <https://blog.technavio.com/blog/top-10-logistics-trends>
- 2 <https://www.statista.com/statistics/821592/worldwide-artificial-intelligence-implementation-in-companies-concerns/>

MULTICHANNEL.....

- 1 <https://www.statista.com/statistics/379046/worldwide-retail-e-commerce-sales/>
- 2 <https://www.statista.com/statistics/896584/frequency-cross-channel-purchasing-omnichannel-shoppers-usa/>

DID YOU KNOW? “WAREHOUSES”.....

- 1 https://en.wikipedia.org/wiki/Boeing_Everett_Factory
- 2 <https://www.statista.com/statistics/728530/industrial-robot-market-size-worldwide/>

DIGITAL FREIGHT BROKERS

- 1 <https://ww2.frost.com/news/press-releases/digital-freight-broker-age-grows-top-service-revenue-opportunity-truck-service-gains-traction>

SUPPLY CHAIN OPTIMISATION.....

- 1 https://en.wikipedia.org/wiki/Supply_chain_operations_reference

SUSTAINABILITY.....

- 1 <https://www.statista.com/statistics/426733/united-kingdom-uk-concern-about-climate-change/>
- 2 http://climatecommunication.yale.edu/wp-content/uploads/2019/01/climate_change_american_mind_december_2018_1-3.png
- 3 <https://www.forbes.com/sites/sarahlandrum/2017/03/17/millennials-driving-brands-to-practice-socially-responsible-marketing/#7f5cfe654990>
- 4 <https://www.eea.europa.eu/highlights/tax-breaks-and-incentives-make>
- 5 <http://www.imo.org/en/mediacentre/hot-topics/pages/sulphur-2020.aspx>
- 6 <https://www.statista.com/statistics/661252/worldwide-new-investment-in-sustainable-energy-by-region/>

CYBER SECURITY.....

- 1 <https://www.carlyleobserver.com/news/local-news/phishing-how-many-take-the-bait-1.23082108>
- 2 <https://www.propellercrm.com/blog/email-spam-statistics>
- 3 <https://cybersecuritysummit.org/2019/01/09/email-continues-to-account-for-90-of-phishing-attacks>

