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## QUO VADIS SUPPLY CHAINS?

Managing supply chains has become a rather complex business in recent years. Supply chain managers are facing numerous challenges. What thoughts are going through their minds? What trends that will have the most impact in the next few years in are they supposed to keep an eye on? What developments will we see that impact supply chains and add to their complexity? How to mitigate the risk of negative impacts from unexpected events and how can positive trends be utilised to shape the supply chains in the near future?



The never-ending struggle to ensure product availability means a lot of changes are required of companies, including the need to innovate in the area of supply chain management. Corporate acquisitions create duplicate distribution systems which then need to be re-modelled for efficiency. Supply chains are built for today's markets, but will they be able to handle those that are sure to replace them in the near future? The development of e-commerce means that customers place their orders on a 24/7 basis and expect overnight fulfilment. But the future is not just same-day fulfilment; it is same-hour delivery. To meet those requirements, there is a strong drive to run shorter supply chains. Still, unexpected problems may crop up, such as immigrants attacking trucks in Calais



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or war hostilities, that have the effect of stretching them. How does one square this circle?

### Anything, delivered anywhere, at any time

Is the future of logistics about autonomous vehicles, drones and no warehouses? Is the word "anticipatory" set to enter the lexicon of logistics for good? Anticipatory fulfilment and anticipatory delivery management, which stem from increasingly stringent customer requirements, make it necessary to predict and look for appropriate logistics solutions. Customers are often faster expressing their wishes than thinking them through. As supply chain managers, we find ourselves increasingly confronted with the need to re-define responsibility and profitability in the digital world.

Security, security, and nothing but security: supply chain managers want to have full access to digital information about every document, and they expect more transparency. Today, these documents are most often in the hands of their logistics partners or providers, and are made available on request. Being unable to access them in a digital version curtails flexibility, for example when a business wants to replace a provider who has

failed it on the quality front. But is it worthwhile keeping everything in one's hands?

Recent years have seen numerous factors at play that have led to a growing complexity of European supply chains. Personally, I put them in four major groups: political factors (immigrants in Calais; war in Ukraine; Brexit); changing customer needs (anything should be delivered anywhere and at any time); innovations; and a greater interest in supply chain fairness and responsibility.

### Relay horse system

Political turmoil adds to the complexity of supply chains, with obstructed transport one of its potential impacts. Still, there are ways to mitigate the negative impacts of unexpected events (not only political ones).

In a sense, autonomous vehicles, which we discussed earlier, could be the antidote to today's transportation problem. Truck platooning trials have been completed in which trucks drove together at a constant speed and the distance between them was much shorter than for human driven vehicles. The arrangement could lower fuel consumption by 15% compared to regular driving. It is estimated that autonomous trucks will appear on our roads in four to six years. They will not replace professional drivers but can provide an alternative where there is a shortage of them.

A bold move for many, the so-called "relay horse" system is another interesting solution to deal with an aftermath of unexpected developments. The system is focused on local carriers who have intimate knowledge of their area and can move around it with superb efficiency. They are aware of threats and how they can be avoided (e.g., unexpected immigrant attacks). A driver who is an infrequent visitor in a given region will lack adequate knowledge and experience. What is the "relay horse" system, then? An example would be a driver who only drives his assigned Warsaw-Poznań route. In Poznań, his semi-trailer is unhooked and another driver takes it from there to, say, Berlin. To simplify a little, we could assume that a basic module is 4.5 hrs drive time followed by a break. It will only take to arrange semi-trailer



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unhooking/re-attachment in such a way that a driver's maximum driving time is 4.5 hrs.

The driver who left his semi-trailer in Poznań takes another one and drives it back to Warsaw. The round-trip driving time would then be nine hours as per our assumption. Another benefit of the "relay horse" arrangement is that drivers stay at home for the night and can spend more time with their families, which, as we all know, is a rare opportunity in cross-border transport. The system facilitates exact cost and profitability calculations for each section of the route. Importantly, too, vehicles on long journeys often spend more time stationary than in motion.

The "relay horse" system requires robust plan-

ning and overall process coordination (driver changeovers, semi-trailer unhooking/re-attachment locations, etc.), but gives incomparably better results and improves transport profitability compared to the traditional model. Better profitability is also a chance for drivers to receive better pay. The system may seem unfeasible to roll out, but there are already examples which prove that it can have tangible benefits. The "relay horse" arrangement is an example of a transport cluster. My feeling is that clusters will again become the talk of the town as a mitigating solution for the effects of unexpected events and a way to reduce cross-border transportation risks. A characteristic feature of today's supply chains is that are dedicated to specific industries or sectors. We are already witnessing a trend within different sectors to work together and share their supply chains. This trend is set to expand due to growing time and cost pressures. Additionally, there are new opportunities to use as-yet unused solu-

### Omnichannel operations

tions which offer a real chance to cut costs, such as urban transit systems. In France, metro is used to transport goods. In Poland, tramway system in many large cities could, and indeed should, be trial-tested with the same purpose in mind.

The boundary between offline and online shopping practices is becoming increasingly blurred. More and more customers require multiple channel service. When buying online, they want to be able to return their purchases in a brick-and-mortar store. Supply chains should therefore strive to be omnichannel ready. Increased customer requirements have led to the development of new solutions which support same-date or even

same-hour delivery (Amazon Prime is an example). In addition, new courier operating models are being trialled, such as car boot deliveries. In our pursuit of speed, however, we should not forget that customers should be left with a choice of when they want to receive their delivery. Fast is not always a guarantee of complete satisfaction, which can be improved markedly if a customer is given such choice. I am sure a lot of people have had the unpleasant experience of a delivery arriving too early. Personally, on a couple of occasions I had to pick up my package at a distant location from where I live, because the courier missed me at my address. It would have been enough to give me that choice and I would have chosen a 48h delivery instead of a 24h one. A simple solution that benefits all parties.

### Digitisation of supply chains (and more)

The frontrunners in the field of logistics innovation are robotic and automation technologies which support zero-error processes and drive productivity to new levels. Concerns that they

could replace warehouse personnel are rather exaggerated, which the Amazon example confirms. The rollout of 270 robots at one of Amazon's warehouses led to more than 100 people being added to its workforce to take care of robot maintenance and management. Robots are increasingly capable of decision-making based on analysis of data they receive. Having said that, there is no clear guidance yet on the role of people in machine decision-making, the division of machine and human responsibilities, or the accountability for errors if they occur.

The breakthrough in sensor and imaging technologies has ushered in a new generation of self-driving vehicles which are more flexible and reliable than ever before. From autonomous forklifts to driverless trucks, vehicles of this type are

transforming logistics by taking safety, efficiency, and quality to new levels. Unmanned aerial vehicles (UAVs) or 'drones' are transforming today's supply chains by adding a new form of express delivery. Whilst they will not replace traditional land-based transportation, they can deliver value in areas with high traffic congestion and in remote locations that are not easily accessible by land-based transport.

mass-production facilities and shipped all over the world. Instead, their schemes will be digitised and sent to small 3D-printing factories closer to the customer. This will allow hyper-customisation of products and, through that, the emergence of new logistics service concepts. New generations of digital identifiers, such as digital watermarking and disposable smart labels, will increase transparency and traceability in the supply chain. While addressing innovations and their impact on supply chains, we need to make a mention of the Internet of Things (IoT) and its potential to connect virtually numerous different devices and speed up data-driven logistics processes. It is esti-

mated that more than 50 billion devices will be connected to the Internet by 2020, generating logistics savings of USD 1.9 trillion. The Internet of Things allows smart objects to participate actively in and control logistics processes. Logistics is one of the major sectors that will derive tangible benefit from the intelligent connection between information and material flows.

### "Go Local"

A growing interest in fair and responsible supply chains has resulted in more customers who base their buying purchasing choices on where the raw materials for their products were sourced, where they were produced, or whether they were transported in a responsible manner. More and more companies declare that they source minerals from conflict-free zones (Conflict-Free Sourcing Initiative reporting templates are an increasingly popular choice). Sup-



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ply chains must become more transparent. Customers need reliable information about products from the moment they were

sourced until their final point of delivery.

Fair access to basic necessities and logistics services may potentially improve the living conditions and economies in both developing and developed regions. "Go local" initiatives allow local businesses to use cutting-edge logistics solutions, whereas global logistics providers can use their innovative solutions and reach to support disadvantaged and hard-to-reach areas to deliver basic medicines or vaccines.

Responsible supply chains combine fair trade and production practices at each stage of the chain. Logistics providers should push for transparency and traceability in global supply chains by providing regular checks and risk minimisation services. Customers require confirmation that all processes are conducted in a responsible manner, including that people work in acceptable conditions and

receive fair pay, and that processes with negative environmental impact are discarded. Importantly, too, reduced resource use and proper management of waste (e.g. from packaging) leads to lower operating costs, broader potential customer base, increased loyalty and improved brand perception. There are a lot of factors affecting the final shape of supply chains, and numerous other examples could be given in addition to the ones described above. What is certain is that today's supply chains are not ready for what the future is going to bring us. It is worthwhile therefore to monitor current technological trends which have a clear impact on those chains. It is worthwhile to follow customers' changing requirements to rearrange supply chains accordingly. It is worthwhile to take up risks and deploy innovative solutions that will increase their flexibility and transparency. Regrettably, we cannot foresee every little thing as supply chain managers. What is important is that our decisions should improve the efficiency of our supply chains and alleviate the negative impact of any unexpected developments, whether economic, political or social.

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