TRENDS IN LOGISTICS 2025

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MATERIAL HANDLING

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Trend radar 2025

Introduction

'Trends in Logistics' is an annual report published by Toyota Material Handling Europe which provides an overview of developments in the world of logistics - with a focus on Europe.
The main objective is to create a deeper understanding of upcoming changes, to help companies make informed decisions regarding investment opportunities and counteract threats.

The report is compiled by continually tracking various trends around us, through our daily participation in logistics operations throughout Europe, and by hosting in-depth discussions with our key customers in the logistics industry. In addition, we collaborate with high quality sources like Gartner and Interact Analysis. However, forecasts of this type will always contain uncertainties, particularly in a fast-changing environment.

TREND RADAR

The trend radar has been developed to capture and plot the main headlines. This year the format of the radar has changed and been divided into three sections:

- **External Factors** where you will find developments that are framing the overall context for the logistics sector, such as laws and regulations, social trends and the political environment - factors all companies need to recognise and adjust to in their operations.
- **Tools and Technologies** describes important technological enablers for logistics, all in different maturity stages and with different potential.
- **Trends in Logistics** summarises the main strategic trends that are emerging in the industry, significantly reflecting the impact of external factors and the implementation of new technologies.

The report gives insights into the main trends that are affecting the logistics industry today.

EXECUTIVE OVERVIEW

There are many important trends that are impacting the logistics industry in 2025. Many of these trends are interrelated, for example the impact of sustainability ambitions, challenges in the labour market and the potential for effective deployment of artificial intelligence.

More detail is provided in the report, but for convenience here is a brief synopsis of some of the main considerations for logistics managers:

- Do you have a clear strategy on how to deal with increased supply chain risk, due to potential geopolitical uncertainties?
- Does your company have a clear energy strategy?
  - CO2 reduction targets and systems to measure and improve
  - Focusing on more energy-efficient use of existing equipment
  - With a plan for adoption of new energy sources
  - Considering energy efficiency and CO2 reduction for road vehicles
- How are you planning for people development in your business, in the face of labour shortages?
  - Retention and upskilling strategies
  - Automation of repetitive tasks
  - Improving working conditions
- Are you investigating new technologies?
  - Automated inventory control
  - Robotics in order assembly
  - Supply chain control towers
  - Computer vision based solutions for real time location systems (RTLS) and digital twins
- Do you have a strategy for collecting, protecting and analysing data?
  - Cyber security
  - Use of AI to analyse data and project performance outcomes
  - Clear data governance
- Have you identified the optimum partners to work with to provide expertise in key areas?

External Factors

There are many external factors that are likely to have an impact on the European logistics industry, ranging from economic forces to new legislation and political influences.

The key factors are identified on the Trend radar and are summarised in this first section of the report.

Economic Outlook

It is expected Europe will continue to face a degree of economic uncertainty in 2025, surrounded by a turbulent world dealing with several ongoing geopolitical conflicts. As a result, central banks, including the ECB, are trying to soft-land the economy and shift focus from fighting inflation to finding a new healthy level of interest rates that allow the economy to grow without overheating, whilst keeping inflation within the targeted range.

It is reasonable to assume that this economic outlook is unlikely to have an adverse impact on consumer confidence and retail sales levels. This suggests a stable or improving position for logistics operations, assuming no major change in terms of political stability.

Growth in the European economy (in terms of GDP) is estimated to increase from 0.8% in 2024 to 1.5% in 2026. Unemployment rates remain at a historically low level (down 45% compared to 2011) and are expected to stay around 6.5%.

Geopolitical impact and Trade Barriers

Not withstanding the anticipated economic recovery in Europe, the unstable geopolitical situation in the world remains, inevitably resulting in a degree of uncertainty, with the risk of having a negative impact on consumer confidence, and supply chain disruption.

According to the Gartner Supply Chain Top 25, antifragile supply chains are a clear trend to deal with increased supply chain risk and to protect against economic trade factors and shipment disruption in conflict zones.

In addition, the substantial imbalance between imports from the EU to China vs China to the EU is a continuous issue for the EU, and although discussions have been ongoing to resolve the problem, no significant progress has been made. Due to concerns of state subsidisation, in October 2024 the EU decided to increase import tariffs on, for example, Chinese cars, by up to 45%. Furthermore, the newly elected US administration has also announced plans for an aggressive raise of import tariffs. The level and impact of these tariffs on world trade is yet to be seen, but there is potential of significant implications for companies with established US trading relationships.

Companies working with international supply chains could potentially also be seriously affected. The first step is to understand the true impact of possible new rules and then take actions like using existing networks to rebalance production and—in the long-term—also work towards shifting production to optimise it within the new economic landscape.

New energy landscape and net zero

Even though major steps have already been made in many countries to reduce global emissions - and positive results are measurable in many regions of the world - overall global emissions are still increasing. It is, however, anticipated that by 2027 over 50% of logistics operations will have readjusted their carbon emissions targets to become carbon neutral (or even carbon positive) in the time span of 2030 to 2050.

For example, Toyota Material Handling Europe's own emissions reduction targets are aimed at reaching net zero no later than fiscal year 2041 (validated by the Science Based Targets initiative).

In the EU there are regulatory requirements in place to encourage a shift towards zero-emission commercial road vehicles over the coming years [see section: Energy Transformation].

For logistics operations generally, it is becoming clear that transforming from fossil fuels to sustainable fuels is not likely to be made by using only one type of fuel, e.g. electricity, but through a combined mix of sources such as electricity and hydrogen.

This new multipath energy landscape will present problems in term sof storing and consuming these sources and the consumption of fossil-free fuels, and will demand clear and long-term legislation, require investments in infrastructure and may offer financial incentives to fuel the transformation.

Logistics operations should therefore be considering their own multipath energy strategy bearing in mind local factors such as availability and the cost of different energy sources, as well as legislative requirements.

Cybersecurity

In recent years, cybersecurity has rapidly become an extremely high priority for many organisations, as some companies had to find out the hard way just how important information protection really is. Famous brand names including Marriott, Adobe, Sony and Garmin discovered the cost of being hacked.

The reason behind cyberattacks is often a criminal financial purpose, but in some cases the origin can also be traced down to countries with strong political interests, and the attack can be linked to geopolitical conflicts, being backed by huge investments.

The global cost of cybercrime is projected to reach USD 10.5 trillion annually by 2025, with attacks growing in sophistication and technical level. Spending on cybersecurity products and services is expected to exceed USD 1.75 trillion in 2025.

Cybersecurity is key to almost every company operating in a connected world, as is logistics. It needs to be a very high priority, not only as a technical matter in how to protect, but equally in terms of guidelines and training for people on working standards or ethical guidelines and how to and react to threats.

Labor shortage, Competence shift, Ageing population

Despite the relatively slow economy, unemployment rates in the EU remain at a low level and it is reasonable to assume that labour shortages will continue to be a significant problem for many companies, particularly in the logistics sector, as the economy improves.

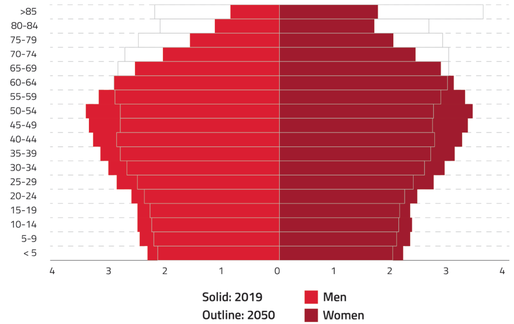
The situation is also fuelled by an ageing population in Europe. The number of people above 80 years of age in Europe is expected to double by 2050, whereas the population below 65 years is shrinking.

This means that automation will become increasingly essential in logistics operations, with a further impact on the workforce, where reskilling and upskilling will be crucial.

Jobs that have historically been performed manually are now being done by robots and automated equipment. However, many other functions will be replaced by AI-driven processes, e.g. service support and analytics for decision making. This new way of working will require people with an understanding and competence to develop software and tools for the new working environment.

Inevitably, the scarcity of people is currently driving salaries to record levels and the transition to new skill requirements demands training to support lifelong people development, rather than relying on education only at the beginning of a long career.

Population pyramids, EU-27, 2019 and 2050
(% share of total population)



Ecosystems and partnerships

There are many factors that can have an impact on the logistics industry – a reality that is evident from a quick look at our Trend Radar. Many of these factors are complex, involving new technologies and fresh thinking.

For most companies it creates the need to expand their network of partners and other competence sources, like tech companies, start-ups and universities, to access the relevant knowledge and insights to cope with the future – because it is highly unlikely that any one company can sit on all the competences and resources needed to maximise opportunities. Creating networks of partners can boost competence, enable broader insights and accelerate development of new and innovative products, ensuring future-proofing and survival.

Reinforcing this point, the CEO of Volvo AB, world leading manufacturer of trucks, buses and construction equipment, Martin Lundstedt, stated: “Partnership is the new leadership”.

Some notable examples of partnerships in the logistics industry include the Toyota Motor Corporation and BMW Group who are strengthening their collaboration towards the advancement of a hydrogen society, Volvo Group and Daimler Truck signing a binding agreement for a joint venture to develop a software-defined vehicle platform, and Maersk and IBM forming a partnership that focuses on utilising blockchain technology to improve transparency and efficiency in global trade.

These partnerships illustrate how companies in the logistics industry are leveraging technology and innovation to enhance their operations and provide better services.

Tools and technologies

Technological advancements and innovation continue at a high pace in the logistics industry. In this report we highlight developments in several areas.

Energy Transformation

ELECTRIFICATION

Electrification of vehicles is the most obvious trend under the heading of energy transformation. For the logistics industry, vehicles used in enclosed environments—e.g. forklifts and tow tractors—have been electrically powered for decades and there is a trend towards electrification also for forklifts that operate outdoors, for loading and unloading.

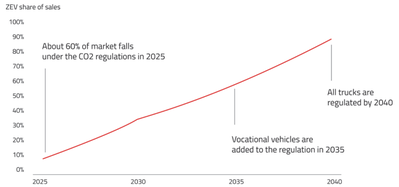
There is a clear transition to lithium-ion battery technology for forklifts, away from outdated lead-acid batteries, as this technology shows improved energy efficiency and a significantly extended working life. The cost of Li-ion batteries has been historically higher than lead-acid units, but the gap is decreasing and generally vanishing completely when considering the extended working life. Furthermore, in multi-shift operations, Li-ion batteries take out the requirement for battery change (and the cost of spare batteries) by adopting an opportunity charging methodology.

To meet the EU's CO2 targets, there also needs to be a significant switch to zero-emission commercial vehicles on the road, with regulatory requirements already in place:

For road vehicles the electrification journey is still in a relatively early phase. In Europe, 20% of all passenger cars are now electric or using plug-in hybrid technology. However, for commercial vehicles the story is different. Whilst there is still a trend towards electrification, it is progressing at a much lower level. The global market for zero-emission medium and heavy trucks shows a rapid growth, but still with very low volumes – some 38 000 units for the first half 2024, with China representing 80%. Within the EU, only a small number of countries are following the trend, with Norway clearly the fastest adopter.

The charging network across Europe remains key. It is growing and has almost doubled between 2021 and 2023, to approximately 630,000 charging points, but further growth is necessary. Europe is also building its own battery production capacity which has been a path full of challenges, including investment funding, technical competences (compared to, e.g. China), raw material sourcing and strategic issues such as balancing cost of material vs green credentials.

Required share of zero-emission commercial vehicles to meet EU's CO2 targets



Source: BloombergNEF. Note: Shows the sales share within the regulated vehicle segments. The targets are set versus emissions levels in 2019. 'ZEV' refers to zero-emmission vehicle. including battery electrics and fuel cells.

The battery arena is also changing fast. For example, Toyota Motor is aiming to launch solid state batteries for cars by 2027, batteries that promise to deliver much improved performance, with a range of around 1000km and fast charging in around 10 minutes. This technology will inevitably have, over time, positive consequences for other classes of vehicle.

LOW EMISSION FUELS AND HYDROGEN

Since electrification in the transport sector is not developing at a sufficient pace and is likely to encounter further challenges regarding infrastructure and scaling, it is evident that a multipath energy strategy is vital. Logistics companies will need to look at different options in going for fossil-free energy sources, e.g. e-fuels, HVO100 or hydrogen.

HVO100 represents an opportunity to reduce CO2-emissions, in most cases without the need for technical modifications. HVO100 is made from vegetable oil such as rapeseed oil or waste-based feedstock like used cooking oil. It has a higher cetane number (c80) than standard diesel and a lower sulphur and aromatics content, with the potential to deliver a significant reduction in CO2 emissions compared to fossil diesel – up to 90% if made from used cooking oil. Many engine manufacturers have already approved the use of HVO100 and the supply network is steadily growing in Europe. Use of HVO100 is expected to grow by some 10 to 20% annually over the coming years, but this trend may change, depending on production capacity investments and governmental policies.

The other potential source of energy is hydrogen, which can be used in different ways, either as fuel in a combustion engine or in a fuel cell where hydrogen is transformed into electricity to power electric motors. In both cases the waste product is water. A positive argument for hydrogen is also its ability to be stored, just like other liquid fuels, counteracting volatility in the energy production infrastructure. The environmental impact of hydrogen depends very much on how it is produced – typically requiring electricity to drive a process of electrolysis. Therefore, access to green electricity for its production is key.

HVO100 could potentially reduce our environmental impact by 90% if made from used cooking oil

Artificial Intelligence

Artificial intelligence is developing at incredible speed, driven by tremendous levels of investment and fast development of hardware, software and different applications. The CEO of Nvidia – one of the leading computing companies in the world, Jensen Huang recently stated: "We have reached the point where AI is designing AI and the progress in the next two years will be spectacular and surprising". In other words, we have only seen the beginning in the development of AI.

In tests such as image classification, visual reasoning and language comprehension, AI has outperformed human beings. However, according to the AI Index report from Stanford University, it still lags in more complex areas like competition-level mathematics, visual commonsense reasoning and strategic planning. The same report summarises that, in 2023, multiple studies evaluated AI's impact on the workforce, indicating that AI helps workers complete tasks more efficiently and enhances the quality of their work. These studies also highlighted AI's potential to narrow the skill gap between low and high-skilled workers.

AI IN LOGISTICS OPERATIONS

At this early stage of development, a common approach in logistics to benefit from AI is missing. However, it is already clear that the most interesting applications are:

- Data cleansing
- Inventory optimisation
- Demand Forecasting
- Computer vision in vehicles
- Defect detection
- Predictive estimated time of arrival (ETA)
- Support tools and chatbots
- Predictive maintenance

The foundation for many of these potential applications is to understand and assess a company's data structure and quality and to investigate potential use cases where AI can be applied to add the best value.

COMPUTER VISION

An example of AI development with particular and already proven focus for logistics is computer vision, since it will support many applications with high potential to drive business value in e.g. warehousing operations.

Computer vision is already a key enabling technology for:

- Automated sorting and inspection
- Inventory management.
- Health, Safety and Security (collision avoidance)
- Autonomous vehicles
- Digital twins and RTLS (real-time location systems)

GOVERNANCE

AI will have the ability to truly transform how businesses operate and will have a great impact on our everyday lives going forward. At the same time the power of AI is clearly identified and governance is and will play an important role.

In Europe, implementing the Artificial Intelligence Act is an important step to regulate areas such as development, sales, commissioning and the use of AI systems. The main purpose of the AI Act is to establish harmonised rules for providing reliable AI systems and safe use of those systems within the EU. This regulation will impact corporate compliance requirements, as companies will need to ensure their AI systems comply with the regulations. Non-compliance with the AI Act can result in hefty fines, ranging from €15 million or 3% of annual global turnover to €35 million or 7% of annual global turnover for severe violations.

Under the EU AI Act, companies must ensure compliance based on the source of their AI tools.

- For in-house developed AI, the company is fully responsible for meeting risk classification, transparency and conformity requirements. Non-compliance liability is resting entirely on the company.
- For third-party AI tools, due diligence is essential to verify vendor compliance. Companies remain accountable for safe integration and use, sharing liability with the vendor if harm occurs.
- When AI is developed by a third party on the company's request, responsibility is shared. The liability will depend on the contract terms and oversight during development.

In all cases companies should maintain clear contracts, monitor performance and document compliance to mitigate risks.

Robots in logistics

The development of robots in logistics is progressing fast and can provide an effective solution to labour scarcity and cost, and provide reliability and resilience. Typical examples of robot applications are picking and sorting robots (including collaborative robots), inventory and delivery drones— although delivery drones are still in an early phase, and transport robots for last mile deliveries. Humanoid robots are gradually developing but still have some way to go in terms of load capacity.

AUTONOMOUS MOBILE ROBOTS (AMRS)

AMRs are solutions for transport applications - for example, pallet transporters and cart towing solutions. They also work in order fulfilment systems such as case picking, goods-to-person and person-to-goods solutions. The main difference between a traditional automated guided vehicle (AGV) and an AMR is the navigation solution. AGVs normally use external markers such as laser reflectors, whereas AMRs usually navigate with the help of floor markers (QR codes) or SLAM navigation.

SLAM (simultaneous localisation and mapping) is a method that builds a map and localises the vehicle in that map, a method used for autonomous vehicles. SLAM algorithms allow the vehicle to map out unknown environments. Then the map information is used to carry out tasks such as path planning and obstacle avoidance.

The AMR market has seen a steady growth, especially in order fulfilment applications. Studies made by Interact Analyses show that this growth will continue—a base scenario for 2030 is in the region of 400-800,000 shipments—and that the main applications will still be goods-to-person solutions.

PICKING ROBOTS

Picking robots are automating some of the most labour-intensive processes and are commonly used for picking, placing, sorting and packaging. Developments are also made in loading and unloading applications for containers to make loose load handling more efficient.

HUMANOID ROBOTS

A humanoid robot is lifelike. There are initiatives from various actors to develop humanoid collaborative robots for the logistics industry, for applications such as order picking. Gartner predicts that, by 2027, 10% of new intralogistics robots will be next-generation humanoid working robots, further addressing labour shortage in the industry, as they have the potential to fully automate warehouses.

OUTLOOK FOR ROBOTS IN LOGISTICS

The fast-paced development of robotic solutions in logistics and warehousing is likely to continue and grow even faster, enabled by the rapid adoption of AI and machine learning (ML), computer vision and advanced sensors, enabling gesture recognition - making robots even more collaborative with humans in the future.

Track and Trace Solutions

Track and trace solutions have become mainstream in most logistics and delivery networks in recent years, with the ever-growing need for visibility and traceability of shipments, and this is a trend that will continue.

The reason for this development is the increasing need to drive customer satisfaction by providing real-time information on shipment data to clients and to provide logistics operators with a clear overview to drive cost and efficiency within their operations. It is also a prerequisite to be compliant from a regulatory perspective and to minimise the risk of theft or loss.

Traditional technologies enabling track and trace solutions are GPS, different kinds of IoT sensors, QR and barcodes, RFID and communication technologies based on mobile networks. Additionally, there are now new technologies being adopted, including 5G, NBIoT (Narrowband Internet of things), WIFI and BLE (Bluetooth Low Energy).

One other technology that might play a growing role in track and trace is AI-enabled computer vision solutions, mainly in intralogistics applications for the tracking of both goods and other assets. However, for the near future, we do not see a disruption in the use of the traditional technologies.

It is evident there will be a continued growth of service providers within this domain, as it is projected by some research institutes to have a growth rate in the range of 10% over the next 6 to 7 years.

Trends in logistics

Competitive success in the logistics industry requires companies to respond to external factors that affect their operations and take maximum advantage of new tools and technologies as they become available. The combination of these elements result in the main trends that can be seen in the industry today. Here are some notable trends.

Sustainable logistics

There is a clear trend in the logistics industry towards improved sustainability, based on three fundamental pillars: social, economic and environmental.

The social wellbeing of people and elimination of waste are key elements in the journey towards more sustainable operations.

The use of safety systems like cameras, collision avoidance and people recognition are growing, to counteract the number of accidents. These technologies also support the elimination of waste through damage to equipment and goods. In total, an item produced in another part of the world, shipped over a long distance and later damaged in a warehouse represents a substantial negative impact.

Regarding environmental improvements, and as indicated earlier in this report [see section: New Energy Landscape and Net Zero], many companies are now committing to carbon-neutral targets in the period of 2030 to 2050.

Defining clear targets is the obvious way to set the direction and to start making the changes needed in complex logistics operations – but in many cases, these changes include new challenges, for instance:

1. **Extracting the correct data**. Supply chain operations have historically been measured in terms of performance, with a focus on cost, time, inventory control etc. But achieving a net zero target calls for new data sets. This new data needs to be identified and sourced, and needs to be defined, analysed, investigated and, in many cases, automated to be able to start the process of improvement.

2. **Understanding and affecting the whole impact of the supply chain.** This is often defined as scope 1,2 and 3 – essentially identifying not only the impact of a company's own operations in direct emissions from owned or controlled sources, but also the impact of the generation of purchased energy used in its own processes and the impact of connected companies in the supply chain, both upstream and downstream. In many cases, the usage phase (scope 3) can be the bigger part of environmental impact and the most difficult area to change - for example a lorry manufacturer's ability to reduce fuel consumption during the usage phase.

3. **Setting clearly defined and measurable targets**. Setting targets that can be measured in a correct way is often complex. The targets must also be set in a way that avoids sub-optimisation, e.g. movement of a problem to another place in the chain. Externally prescribed methodology is an option to address this challenge – for example, Toyota Material Handling is committed to science-based target setting [see SBTi – Science-Based Targets initiative].

Energy efficiency

A key part of the trend towards more sustainable logistics operations is a notable drive towards improved energy efficiency. As discussed earlier in this report, new energy technologies for vehicles provide improved performance, but in most cases require investment in new equipment. However, striving to reduce the overall need for energy in the way existing equipment is used can also be a major contributor, not only to sustainability efforts but also the financial performance.

This can be achieved in many ways:

- Optimising driving and picking routes using advanced software
- Educating drivers on eco-friendly driving practices.
- Load optimisation by ensuring vehicles are fully and efficiently loaded

The use of telematics and IoT devices to monitor and manage energy use in real-time is becoming a key option in logistics operations.

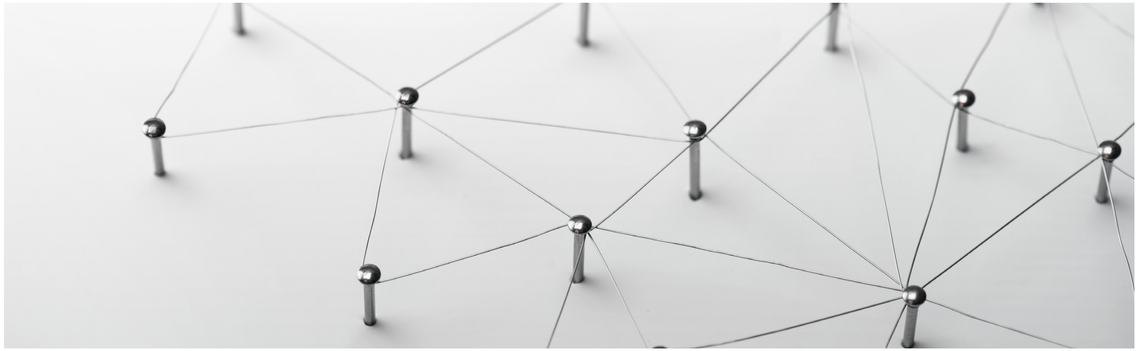
Other non-vehicular improvements are also being adopted by many organisations, including the installation of energy-efficient lighting, heating, and cooling systems, and investments in local energy sources, for example solar panels.

Data Governance and Management

Well-structured data management and governance is a prerequisite in providing the foundation for advanced, predictive and prescriptive analytics. Effective data governance ensures that data is accurate, complete and reliable – because, to benefit from the digital platforms and tools that exist today, reliable data is essential. High-quality data combined with tools and platforms for visualisation enables organisations to make better, data-driven decisions, which can improve business outcomes and competitive advantage.

Data governance ensures that data is easily accessible to those who need it, while maintaining security and compliance. This democratisation of data empowers employees to use data effectively in their roles.

This is becoming a key strategic issue for leading logistics companies.



Control Towers and Supply chain visibility

A clear trend in the world of logistics is the adoption of RTTVPs [Real-Time Transport Visibility Platforms] with, for example, the market size in North America estimated to have trebled in recent years, since the pandemic.

Logistics control towers have become the essential visibility-enabling, intelligence-gathering and data-modelling platforms of choice for supply chains across the world. By 2026, 80% of global and large enterprises will have adopted logistics control towers to improve shipment visibility and performance analytics. Of course, the vital part of any control tower is having access to accurate, real-time data, based on tracking technology [see section: Track and Trace Solutions].

The trend towards real-time visibility throughout the supply chain will continue to grow, significantly driven by consumer demands, but also as a prerequisite to drive efficiency and manage a seamless chain of interactions and handovers in the supply chain. Improved visibility can also avoid costs derived from penalties through late arrivals. It can also increase customer satisfaction and delivery experience through proactive action when deviations occur from the plan (e.g. the ability to update estimated times of arrival to customers), allowing them to assess whether changes are needed.

E-commerce: Personalised Delivery Options and Reverse Flows

The continuous growth of e-commerce is accelerating supplier performance, which in turn is driving demand for ever-faster deliveries, with almost four out of five consumers prioritising delivery within two days. Consumers also expect customisable delivery windows, real-time tracking and the ability to reroute packages, which has led businesses to invest in technology that supports these features.

Key trends in e-commerce from a logistics viewpoint include the integration of AI and machine learning for route optimisation, resulting in up to 20% reduction in fuel cost, and facilitating increased use of drones and autonomous vehicles to enhance delivery speed and efficiency. Sustainability is of course another major focus, with companies adopting electric vehicles and eco-friendly packaging to reduce carbon emissions.

REVERSE FLOWS

According to Fortune Business Insights, the global reverse logistics market was valued at $768 billion in 2023 and continues to present a great challenge in e-commerce. Return rates are increasing, in part due to higher sales, but also due to economic uncertainty and consumer confidence. Returns processing requires significantly more focus and effort than outbound logistics with single item handling, inspection, grading, repacking, refurbishment, repair, restocking and other activities. A proportion of returns are also scrapped which is a major issue from a sustainability perspective.

To deal with the significant challenge of return flows it is broadly recognised that clear steps need to be taken in logistics operations:

- the process needs clear ownership, and KPI's to efficiently recycle returns and realise maximum value.
- Solutions to drive down return rates are much needed, potentially by charging fees and using better shopping support tools (e.g. digital dressing rooms) to improve order satisfaction rates.

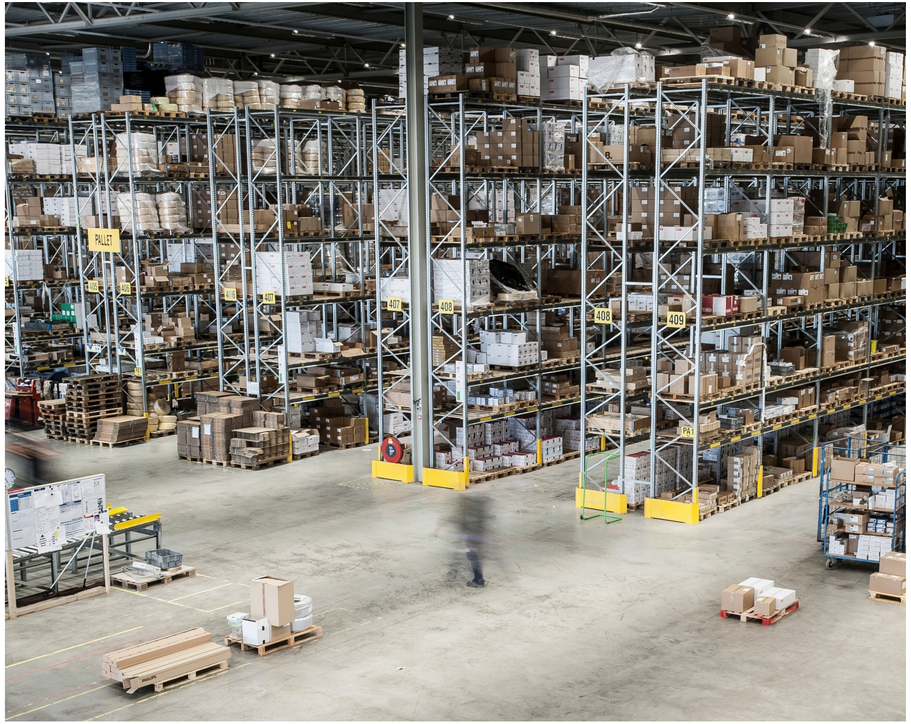
Key trends in e-commerce from a logistics viewpoint include the integration of AI and machine learning for route optimisation and facilitating increased use of drones and autonomous vehicles.

Automated Inventory control

In large warehouses, with tens of thousands of stock keeping units (SKUs) and high stock turnover rates, inventory control is a significant and continuous challenge. The process can be slow and time consuming, and many companies employ teams of staff specifically for this purpose.

Keeping accurate and up to date inventory control is vital from a legal accounting perspective and to maintain a good level of service.

Automated inventory control solutions are becoming more and more available, thanks to better in/outcoming movement tracking and by deploying scanning devices such as robots and flying drones for stock checks. The possibility to automate inventory control is an increasingly interesting business case and is under development by many tech companies working in the logistics sector.



Warehouse simulation and modelling

AI and machine learning is now facilitating simulation and modelling that surpasses traditional warehouse management systems. Traditional WMS (warehouse management system) solutions were built primarily to manage inventory, process orders, control warehouse tasks and provide basic reporting. With the increased need to ensure the most efficient logistics processes and to minimise costs, there is a clear trend towards better solutions providing predictive analytics and optimisation. This is also driven by the increased use of automation, the need for omni-channel operations and the increasing number of returns in e-commerce.

AI can take performance in warehouse simulation and modelling to a new level. These software solutions can be used in many areas to provide predictions and insights, to help make informed decisions.

The applications in which AI-supported warehouse simulation and modelling software can be used include:

- Inventory management
- Picking optimisation
- Planning of warehouse layout
- Prediction of demand
- Automation and robots
- Digital Twinning

Engage and Retain in Logistics

Labour shortages are a major challenge for many companies and this problem is likely to continue, driven by demographic factors including an ageing population [see section: Labour Shortage, Competence Shift, Ageing Population]. Companies in the logistics sector are particularly exposed to this challenge, due to the physical, repetitive and sometimes stressful nature of the work.

According to Gartner research, 49% of the employees who left their organisations in 2022 cited burnout driven by work frictions as one of their reasons for departing. When supply chain employees are burned out, engagement declines and performance and accuracy is threatened. The intent to stay in their current role among the supply chain workforce continues to decline. The findings from Gartner show as few as 36.2% of supply chain employees reported a high intent or desire to stay with their current organisation.

Automation is a natural solution in many applications, where machines can undertake repetitive tasks, reliably and accurately, increasing safety and accuracy. This can reduce headcount requirements and release staff for more challenging responsibilities.

49% of the employees who left their organisations in 2022 cited burnout driven by work frictions as one of their reasons for departing.

IMPROVING STAFF ENGAGEMENT

It is recognised that many companies need to redefine skills, roles and structures to drive performance and to make sure they have the right management combined with investments in working conditions and people development. People-centric strategies are needed to boost workforce engagement and to understand and meet basic employee needs like respect, recognition, autonomy and flexibility. To have a “human deal” clearly defined and in place will provide a competitive edge for many companies going forward. The deal can include benefit packages, but should also focus on career plans, recognition and feedback and promoting a good work-life balance.

COMPETENCE SHIFT

In the logistics sector there is expected to be a need for a competence shift in the workforce, significantly influenced by technological advancements, particularly AI and automation, which are reshaping job responsibilities and necessitating upskilling and reskilling of people. The World Economic Forum predicts that 44% of core skills will change within the next five years, highlighting the urgency for continuous learning and adaptation. In logistics, this shift is driven by skills shortages, technological integration and global supply chain disruptions, emphasising adaptability, strategic planning and data-driven decision-making. According to Gartner, 50% of logistics companies will be required to upskill their talents due to the rapid tech development.

DIVERSITY, EQUITY, AND INCLUSION

The need for diversity, equity and inclusion (DEI) is increasingly recognised as a critical component for organisational success and innovation, particularly in sectors like logistics and supply chain management. Companies with robust DEI programmes report improved recruitment and retention, enhanced organisational performance and a stronger business reputation. In the logistics sector, organisations like Maersk and FedEx have demonstrated a strong commitment to DEI through inclusive hiring practices, leadership involvement and a focus on gender equity, which correlates with better business performance and innovation.

Trends for tomorrow – and later

The trend radar also looks further into the future, providing insights into long-term developments.

FUTURE EXTERNAL FACTORS

It is reasonable to assume that the European commission will continue to introduce directives to enhance competitiveness, strengthen defence capabilities and foster economic stability, whilst also advancing digital and green transitions. Alongside this, the new energy landscape will continue to evolve with a further shift towards renewable energy sources and the development of green hydrogen, which will provide scope for advanced energy storage solutions, and focus will remain on emissions, but on a global scale.

The ageing population will continue to be a key factor.

FUTURE TOOLS AND TECHNOLOGIES

Innovation keeps a fast pace and many technologies already in the early stages of development are likely to impact the logistics industry in years to come. Notable developments include solid-state batteries, which will offer higher energy density, faster charging times and longer lifespan. Staying with energy, the hydrogen economy will continue to develop, with a focus on green hydrogen, aiming to reduce greenhouse gas emissions.

Communication will be further fine-tuned with increasing use of 5G networks and the prospect of 6G in the longer term, offering ultra-high speed and ultra-low latency, together with enhanced connectivity, aiding autonomous systems.

The use of artificial intelligence is likely to grow exponentially, evolving into superintelligence, aided by quantum computers. Other technologies that will have significant impact on the logistics industry include the development of humanoid robots and the ability to control equipment remotely.

FUTURE TRENDS IN LOGISTICS

In years to come, Open Logistics Platforms are in prospect, to enhance visibility, collaboration and efficiency across global supply chains. These are likely to be further supported by using Blockchain technology to enhance transparency, efficiency and security.

The Physical Internet (PI) is a transformative logistics concept, inspired by the digital Internet, aiming to create an interconnected and an efficient global network for transporting goods and enhancing sustainability and flexibility.

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