

CONSUMER PACKAGED
GOODS & RETAIL

THE LOGISTICS PLANNING FRAMEWORK FOR EFFICIENCY, COST REDUCTION AND SUSTAINABILITY

Leverage continuous optimization for improved end-to-end efficiency
of your supply chain.





RETHINKING TODAY'S LOGISTICS CHALLENGES

The fast-growing e-commerce industry has contributed to the increasing demand in consumer goods, creating supply chain complexity. Furthermore, retailers struggle to maintain their prices with rising costs and inflation. From warehousing to distribution, the lack of real-time information and siloed data impact retailers' efficiency in fulfilling orders.

This ebook addresses the efficiency gaps between each checkpoint that can be bridged by implementing a logistics solution to maximize productivity, sustainability and cost savings. Attention to detail can streamline supply chain processes to ensure peak efficiency. Additionally, real-time data can further improve visibility across processes to reduce stockouts, disruptions and bottlenecks.

With Dassault Systèmes' proven logistics software, retailers can achieve optimization success through planning with the built-in simulation capabilities of virtual twin technology. To support optimization efforts, these simulated test runs reduce inefficiencies and lower costs while facilitating sustainable logistics plans that maximize customer satisfaction.

Read on to discover the full power of **advanced logistics planning**, enabled by Dassault Systèmes.



CHAPTER I

EFFICIENT

Warehouse Strategy



As the starting point of the supply chain network, a warehouse or distribution center offers storage space that supports retailers' safety stock strategies, preventing empty shelves in stores to create a positive consumer impact and enhance brand reputation. The overall coordination of warehouse processes is crucial at this stage to ensure that delivery schedules are kept on track. With a thorough understanding of warehouse activity, retailers can boost efficiency through layout planning and space utilization. Retailers should also focus on schedule coordination and workforce planning to ensure a fully optimized warehouse operation.

KEY STRATEGIES FOR ADVANCED WAREHOUSE PLANNING



Fully utilize warehouse layout

For warehouses, bigger doesn't always mean better: The larger the space, the higher the cost. The key is to understand the volume of activity to maintain a balance between the daily operations and occupied space for storage and equipment through slotting optimization. With an understanding of the space and delivery schedules, the virtual twin can be used for simulation and testing to validate whether certain investments in infrastructure are worthwhile. This can reduce costs and eliminate errors in the process of increasing scale and speed to boost warehouse productivity.



Optimize storage space for inventories

Consumer goods may be stored on pallets or in boxes, while some goods may also require special storage conditions such as refrigeration. An industrial racking system storage enables full optimization of the space for both horizontal spaces and its height. The virtual twin technology is able to test and simulate the best ways to arrange goods accordingly for optimal storage. Inventory management and control can also be achieved through real-time inventory tracking to improve accuracy and accelerate order fulfillments, avoiding stockouts as well as reducing waste from overstock.



Coordinate docking at loading and unloading bays

Strategic management of dock scheduling for inbound and outbound logistics plays an important part in preventing bottlenecks at warehouses or distribution centers. This can all be managed with our logistics optimization solution, where simulations of specific deliveries can be tested accordingly beforehand. For instance, it supports retailers' cross-docking strategy that minimizes product touches, achieves faster time to market, reduces the need for storage space, optimizes inventory control and reduces costs.

During periods of peak demands, our logistics solution can further support warehouse operations to cater to consumers' needs, building operational resilience in the process.

3 STEPS TO BUILD WAREHOUSE RESILIENCE WITH OUR LOGISTICS SOLUTION



1 Ensure a minimal amount of stock is always available with smart inventory management

2 Plan and assign workers to shifts based on the expected demand through an integrated HR system

3 Manage delivery fleet with simulated route planning to keep delivery schedules on track

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In order to overcome shipment delays, our solution helps maintain efficient safety stock levels in the warehouse to prevent empty shelves at stores.”

– Bas van der Bijl
DELMIA Industry Process Expert Senior Specialist,
Dassault Systèmes

CASE STUDY

Optimized picking and loading operations with the virtual twin

OVERVIEW

A prominent food redistributor in the United States faced challenges in optimizing its picking and loading operations. With large-scale warehouse operations servicing both bulk and individual item orders, the client needed a solution to improve productivity and reduce congestion in its facilities.



CHALLENGE

- **Vast warehouse spaces:** Large, segmented warehouses meant utilizing various specialized vehicles, which often became inefficient due to their varying reach and speed
- **Mixed-mode picking:** Orders included both bulk pallets and individual cases, adding complication to the picking process
- **Vehicle utilization inefficiencies:** Vehicles frequently ended up “out of place” after completing tasks across zones, leading to wasted travel time and reduced productivity
- **Inefficient picking operations:** Individual cases required transport over long distances, complicating congestion at the loading dock
- **Dock congestion and quality concerns:** A crowded loading dock presented risks of product damage during the manual consolidation of pallets



SOLUTION

- **Zone-based picking strategy:** Using a zone-based approach, temporary drop zones were incorporated to consolidate individual cases and small pallets away from the loading dock, minimizing congestion and improving worker safety
- **Virtual twin scheduling optimization:** A virtual twin model simulated warehouse vehicle movements, allowing for optimized scheduling that minimized travel distances and improved coordination between the picking and packing process
- **Streamlined order fulfillment:** The new scheduling system effectively managed complex picking requirements, ensuring efficient consolidation of customer orders for shipping



RESULT

- ✓ **Enhanced productivity:** Vehicles and operators remained in designated zones longer, reducing travel time and increasing productivity
- ✓ **Reduced congestion and improved safety:** Fewer pallets and equipment at the loading dock created a safer working environment with lower accident rates
- ✓ **Optimized use of resources:** Forklifts were efficiently utilized to eliminate unnecessary long-distance transport of single items



CHAPTER II

MAXIMIZED

Fleet Management



Transportation is the next crucial link in the distribution network, with it being the most time-intensive process, where the time spent on the road and route distance matters. The types of vehicles in a retailer's fleet present unique challenges, particularly in terms of cost and sustainability. One shared issue for all transportation trucks is empty miles, which contributes to supply chain inefficiency. However, by strategically deploying electric trucks and taking payload capacities into account, retailers can address these challenges effectively to improve efficiency while maximizing resources. Additionally, driver satisfaction is another key focus that retailers should invest in to keep their operations running smooth with timely deliveries.

THE KEY TO OVERCOMING EMPTY MILES

According to the American Transportation Research Institute (ATRI), empty miles in US trucks have accounted for 15 to 20% of trucking miles, running up staggering costs in the past decade alone.¹ Retailers can minimize empty miles by striking a good balance between capacity and demands. The best practice is to combine partial loads of goods for optimal loading during inbound and outbound transportation. Dassault Systèmes' logistics planning software actively reduces empty miles by configuring the loading of goods to combine orders in a single trip, sending out fewer delivery trucks on the same route.

Deliver more goods with fewer trucks

For one-way trips, the ideal fleet capacity should be loaded to at least 80%.



¹ "Truck Driver Shortage and Supply Chain Issues Create Challenges in Europe and Asia" by Chem Analyst (April 2024)

Powering trucks with electricity

For retailers using electric trucks, they understand that these trucks are manufactured with a limited driving range based on their battery capacity. The best way to fully utilize an electric vehicle is to balance between the amount of range a vehicle has and the length of the route it is expected to travel. Based on the delivery distance, the vehicles are deployed and arranged for deliveries according to their range.

5 KEY CONSIDERATIONS FOR ELECTRIC VEHICLE UTILIZATION



Delivery route

- EVs are great for last-mile urban deliveries because they are emissions-free with quieter engines, making them the best option for traveling in traffic



Charging needs

- EVs require rapid charging infrastructure, but current facilities mostly cover slow-charging, one of challenges that hinders wide adoption by retailers
- It is important to manage the range, so the trucks won't run out of electricity



Payload

- Battery packs in an electric truck affects its payload capacity
- Transportation planning needs to account for payload as the battery capacity has to cover both the delivery range and the electricity needed for the refrigeration of consumable goods to keep it fresh



Vehicle size and capacity

- The size of an electric vehicle and its capacity along with payload should be taken into consideration to allow the most optimized loads of goods to be transported



Delivery strategy

- Retailers should come up with logistics strategies based on their locations, with battery capacity being the main consideration. Depending on their operational area, they have to manage the strategy and type of deliveries they are making, quick adaptation is key

DRIVER SATISFACTION: KEEP DRIVERS HAPPY TO KEEP TRUCKS RUNNING



The global shortage in drivers is a growing concern that severely impacts retailers’ ability to expand their operations



In the European market, nearly 50% of companies are experiencing reduced productivity, with 39% of them reporting a decline in revenue due to this shortage²



Driver retention is the answer to this problem, ensuring smooth running deliveries with little to no delays



The solution monitors driving route execution and stopping frequencies to take into account personal preferences, creating optimized route schedules paired with fair compensation that increase driver retention

The composition of vehicles in retailers’ fleet will continue to evolve as regulations change over time. As 2030 draws near, more and more transportation trucks run by biodiesel and synthetics fuel will be deployed to adhere to the emissions regulation. At present, biodiesel trucks are widely used in the UK for the transportation of heavy goods in between distribution centers and warehouses.

² “Driving Sustainability: Reducing Empty Miles in Road Freight” by Einride (February 2024)



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A retailer's fleet composition will transform and evolve over time, so all aspects such as range, charging infrastructure, recharging needs and so on will be managed in different numbers as we go forward. The managing process is something that our solution can support, and the flexibility to support that complexity is a big part of the value that we deliver.”

– Dan Inman
Consumer Industries - Solution Owner for Manufacturing
and Logistics,
Dassault Systèmes

CASE STUDY

Reducing transportation cost with the virtual twin

OVERVIEW

A rapidly growing supermarket retailer in Europe with an extensive distribution network and a large fleet of trucks aims to enhance its omni-channel presence and expand its market reach while maintaining cost efficiency.



CHALLENGE

- **Meeting delivery schedules:** Delivering goods in alignment with store opening times and delivery windows
- **Compliance with environmental regulations:** Adhering to vehicle access rules and emissions restrictions
- **Labor law adherence:** Complying with regulated driver hours and shift patterns
- **Multi-temperature logistics:** Managing multi-temperature trucking for both ambient and cold-chain products



SOLUTION

Dassault Systèmes' **Perfect Logistics** solution was incorporated, which includes the dynamic logistics resource optimization. A virtual twin of the retailer's logistics operations was utilized for simulation to optimize logistics planning in real time.



RESULT

- ✓ **Transportation cost reduction:** Transportation costs were reduced by up to 10%
- ✓ **Operational savings:** Enhanced resource management resulted in operational cost savings of up to 3 million euros per year
- ✓ **Sustainability improvements:** The client achieved more sustainable operations by reducing their carbon footprint and supporting the transition to an electric fleet

An aerial photograph of a yellow semi-truck with a long orange trailer driving on a two-lane asphalt road. The road is flanked by dense evergreen forests. The lighting suggests late afternoon or early morning, with long shadows and a warm glow on the trees.

CHAPTER III

SUSTAINABILITY- COMPLIANT

Route Planning





Sustainable planning is a critical element that drives long-term logistics success, supporting revenue growth while reducing environmental impact. This is because investors make decisions based on a business' environmental reporting while consumers make purchasing choices based on a retailer's eco-credentials. Furthermore, efficiency plays a big part in sustainable planning as it supports retailers' operations in the long run, helping to achieve cost and carbon dioxide (CO₂) reduction goals.

Here are the key characteristics of a sustainable supply chain network:

- Lower fuel consumption and CO₂ emissions: Made possible through smart fleet management and optimized routing
- Lower costs: Achievable by factoring in driver wages and fuel costs into route planning
- Minimized delays: Enabled by real-time data that drives navigational flexibility

By creating highly efficient routes through optimized planning, retailers can achieve cost savings while lowering CO₂ emissions with decreased fuel consumption. Using key sustainability metrics of our logistics solution, retailers can design low-emissions delivery routes that also minimize transportation costs.



KEY APPROACHES BASED ON OUR SOLUTION'S SUSTAINABILITY METRICS

Low-carbon strategy

To reduce transportation costs and CO₂ emissions, our solution enhances route planning efficiency, leading to reduced fuel consumption.

Daily simulations

To plan the most efficient routes, our solution is able to run daily simulations to optimize KPIs within the required regulatory constraints.

Stakeholder alignment

Our solution keeps all stakeholders, especially drivers, in the loop with real-time updates, allowing them to follow optimized plans with the least driving distances for maximum effectiveness.

Historical focus

Our solution takes into account retailers' previously prioritized cost savings and operational efficiency metrics, such as vehicle count, travel distance and hours on the road.

Long-term planning

Through simulations, our solution evaluates strategic changes, such as adjusting fleet composition or distribution center locations for greater sustainability benefits.

Local emissions-regulations

Enabled by our solution, retailers can navigate sustainability compliance and adhere to traffic regulations on noise and CO₂ emissions with ease.



Customizable route simulations

In the ever-changing logistics industry, the ability to customize delivery routes based on business needs and emissions regulations is crucial for long-term operational sustainability. Providing increased agility, the Dassault Systèmes solution is able to consider all the metrics while simulating different scenarios with different configurations. Retailers can simulate routes for daily deliveries while fine-tuning plans according to their operational KPIs.

To improve delivery efficiency, driver schedules can be optimized with fewer stops for the fastest delivery routes. For electric vehicles, charging breaks can also be factored into route planning, allowing trucks to recharge at supermarkets while offloading goods.



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One of the advantages of the solution is that we can simultaneously deliver diesel vehicle routing for longer distances while prioritizing electric vehicle routing for urban deliveries in emissions-regulated areas.”

– Dan Inman

Consumer Industries - Solution Owner for Manufacturing and Logistics, Dassault Systèmes

CASE STUDY

Boosting agility in logistics planning with the virtual twin

OVERVIEW

A rapidly expanding European supermarket retailer with over 1,000 stores supporting an omni-channel presence and growing home delivery service sought to optimize logistics routes.



CHALLENGE

- **Store and delivery coordination:** : Meeting strict delivery windows and scheduling to match store team availability
- **Access and emissions compliance:** Navigating varying regional vehicle access rules and emissions restrictions
- **Driver and vehicle constraints:** Managing driver hours, shift patterns and multi-temperature trucking within the same fleet
- **Regulatory requirements:** : Adhering to regulations for transporting temperature-sensitive items like fresh produce



SOLUTION

Dassault Systèmes introduced the Perfect Logistics solution, creating a virtual twin of the retailer's logistics operations and allowing the retailer to:

- Adjust transportation plans flexibly and precisely
- Account for complex delivery, regulatory and vehicle constraints
- Optimize multi-temperature fleet operations, reducing fleet requirements and ensuring compliant transport



RESULT

- ✓ **Reduced transportation costs:** Up to 10% reduction was achieved through optimized routes and efficient fleet usage
- ✓ **Enhanced resource utilization:** Improved resource management, saving up to 3 million euros annually in operational costs
- ✓ **Sustainable operations:** Fewer trips and optimized routes reduced carbon emissions during transportation
- ✓ **Electric fleet support:** Enabled seamless integration of electric trucks into the client's supply chain
- ✓ **Increased agility:** Real-time visibility and adaptability allowed quick adjustments to meet demand surges and regulatory updates

SUPPLY CHAIN REVOLUTION: WHY OPTIMIZE WITH DASSAULT SYSTÈMES

Many supply chain inefficiencies can be addressed through improved insights and integrated data, enabling retailers to better meet consumer demands. Equipped with these key insights, retailers are able to create a well-designed supply chain network that boosts efficiency, supports sustainable operations and maximizes cost savings. The right logistics optimization solution can help them achieve success through agile and flexible planning. And Dassault Systèmes' proven logistics solution makes this happen by providing end-to-end visibility that eliminates information silos.





Designed to drive continuous optimization, our logistics planning solution equips your distribution network with agility through these three core capabilities:

1. Seamless integration and adaptive learning ability

The solution optimizes routing and integrates with your external systems by dynamically adapting and adjusting routes to align with current demands, driver schedules and legal restrictions. Using telematics, it monitors real-time location and driving behaviors, countering delays with quick responses. While currently relying on historical analysis to predict the traffic and weather, the solution is developing the predictive behaviors of experienced drivers to anticipate and make adjustments to improve logistics reliability.

2. Competitive boost against market trends and external disruptions

The solution enhances your ability to strategize and respond to market trends and disruptions to support your competitiveness. It optimizes routes based on environmental regulations, like low-emission zones, to ensure suitable vehicles are deployed in compliant areas. By maintaining well-stocked shelves and supporting sustainable practices, you can align with eco-conscious consumers and stand out among your competitors.

3. Smooth software implementation support

Retailers are often uncertain about implementing new optimization software, with concerns surrounding compatibility, trust, job impact and operational security. To ease the transition, a one-week demo can showcase immediate value to build confidence. The transparent and explainable analytics demonstrate how job roles can be supported and not replaced by automation. Through simulated tests, it allows you to assess the impact of any changes, such as introducing electric trucks to ensure adaptation at your own pace. Strong service delivery and risk management practices can further ensure smooth, uninterrupted operations for you from day one.



Ready to future-proof your supply chain? [Click here](#) to see our comprehensive range of solutions for consumer goods and retail companies.



