



IT Has Sandboxes, But Where Do Logistics Professionals Play?

The Case for Parcel TMS Simulations

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WHAT'S INSIDE?

This white paper will present an overview of the parcel management challenges posed by the dynamic business-to-consumer (B2C) eCommerce delivery environment and how Sendflex parcel TMS simulations can help supply chain professionals gain insights into opportunities for controlling rising shipping costs, while optimizing capacity and customer delivery experiences.

eCommerce growth has transformed the logistics industry

Even with the recent post-COVID slowdown in online sales, current forecasts suggest that U.S eCommerce will account for approximately 21% of retail purchases and reach [\\$1.14 trillion in 2023](#), an increase of 10% over 2022. This means the industry can expect a lot more growth as well as a continued increase in parcel volumes. According to [Pitney Bowes](#), an estimated 58 million parcels are shipped every day in the U.S., with parcel volumes expected to grow between 5.5% and 11.5% CAGR by 2027.

Growth also means that the cost of shipping parcel will increase as well. Although there was a [2% dip in U.S. parcel volumes in 2022](#), there was a 6.5% rise in parcel carrier revenues. Major parcel carriers appear intent on focusing on profitability over volume growth. One parcel carrier CEO said that her corporate strategy was to get “better, not bigger”— a trend that will likely have significant repercussions for eCommerce businesses.



In 2022, U.S parcel volumes contracted by 2% while carrier revenues rose by 6.5% and general rate increases and surcharges have left many shippers facing an effective increase of more than 10%

Shippers are already implementing new eCommerce supply chain strategies in reaction to higher parcel volumes, increased parcel carrier rates, and consumer demand for faster, free, and on-time delivery. Omnichannel fulfillment is replacing the traditional, centralized distribution system models to reduce shipping costs and expedite deliveries, particularly in densely populated urban areas. This strategy also reduces pressure on larger, centralized distribution hubs, decreases unproductive stems, and increases the number of stops per day delivery vans can achieve.

eCommerce Driven Innovation and Adaptation

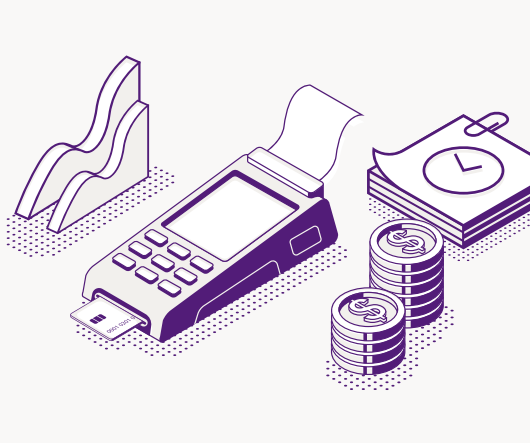
- Decentralizing distribution by moving inventory in micro-distribution centers closer to the end consumers
- Leveraging enterprise-wide inventory through fulfillment strategies like zone skipping and BOPIS
- Diversifying carrier networks for greater flexibility, better geographic coverage, and service quality

Simultaneously, eCommerce shippers are diversifying their carrier networks to meet consumer demand for more delivery options such as parcel lockers, carrier store pickup, over-the-threshold, room-of-choice, setup, and waste removal services. As a result, traditional carriers like UPS, FedEx, and USPS are finding their dominance increasingly challenged, as Amazon and more final-mile couriers, gig-economy services, and regional parcel carriers enter the market.

Planning shipping from a single distribution center using a single carrier was not that complicated. But now determining how, when, and where to engage a more diversified carrier network throughout decentralized omnichannel fulfillment centers is an increasing challenge.

Parcel management is now a lot more complex

Diversifying carrier services to deliver from a multitude of origins is making parcel management very complex. Especially when it comes to determining cost and time in transit. Dynamic tiered carrier discounts and the expansion in the number of surcharges and accessorial fees are driving effective price increases significantly higher than the General Rate Increases (GRIs) published by carriers.



The gap between what shippers expect to pay and what they actually pay can be as high as 20%

As a result, the inability to accurately calculate parcel carrier costs is contributing to a widening of the gap between what shippers expect to pay and the actual (and unexpected) costs presented on carrier invoices. That gap can reach 20% or more, according to Hannah Testani, CEO of Intelligent Audit.

[Parcel spend leakage](#) has become a formidable challenge, creating financial blind spots that chip away at profit margins.

Beyond the increases shippers are seeing in effective carrier rates, other outside industry forces will likely continue to drive parcel shipping costs higher. Inflation, labor disputes, driver shortages, and unpredictable fuel prices all add carrier price pressures which are then passed on to shippers. And yet, intensified competition, notably from Amazon's expansion into delivery services, is likely to continue to challenge shippers to meet consumer demand for faster, free, and on-time deliveries.

Parcel industry dynamics highlight the need for innovative solutions and data-driven AI strategies to insulate eCommerce businesses from uncertain shipping costs and maintain more predictable and sustainable margins.

Digital transformation of eCommerce fulfillment processes requires more automated, intelligent parcel shipping technology

To successfully compete in B2C eCommerce, businesses are having to rethink and digitally transform their parcel management processes from point-of-sale store fronts, to order allocation, to fulfillment, to shipping. They need to accurately determine the most cost-effective way of serving their loyal customers who now more closely associate their delivery experience with company brand. This requires a level of intelligence now missing from most parcel management systems.

Traditional heavy freight TMS platforms have always incorporated intelligent “optimization” features. That's because unlike the parcel management systems, freight TMS platforms have had to automate selection decisions across hundreds of LTL and TL carriers, consolidate loads, mode shift where possible, and provide analytics for planning and simulations. And all without costly program customizations.

But today, as modern eCommerce has introduced more complexity into the parcel market, the challenge for management is more like the heavy freight market with more delivery services and omnichannel fulfillment options to choose from. That's why a new generation of parcel technology has emerged, featuring AI and data-driven tools to automate and optimize decision-making in an environment which is now well beyond the capacity of human beings to manage.

	Sendflex Parcel TMS	Legacy Shipping Systems
Multi-carrier label printing	✓	✓
Cloud-native	✓	✗
Micro-services architecture	✓	✗
Auto-region failover	✓	✗
Multi-region failover	✓	✗
Carrier contact monitoring	✓	✗
No-code instructions	✓	✗
On-board rating/TinT engine	✓	✗
Cartonization/palletization	✓	✗
“What-if” simulations	✓	✗
Optimization planning	✓	✗



Beyond simple label printing: Introducing Sendflex Parcel TMS

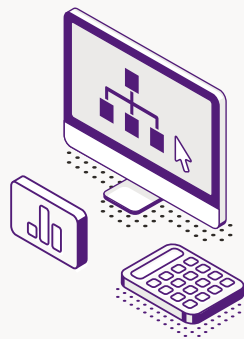
For years traditional multi-carrier shipping systems have automated weighing and label printing in the last 100 feet of warehouse conveyors. They perform that function well in conjunction with carrier APIs. But today they fall short when it comes to automating complex decision-making throughout storefront, order allocation, and fulfillment processes. Sendflex's next generation parcel TMS platform takes legacy shipping systems technology to the next level. Sendflex parcel TMS conquers complexity by combining data-driven decision-making with high speed execution across enterprise fulfillment process.

Sendflex parcel TMS brings together three groundbreaking innovations:

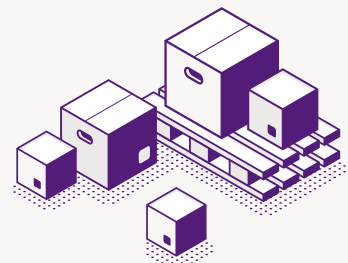
1) configurable business rule instructions, 2) onboard optimization engine that doesn't rely on slow and unreliable carrier rating APIs, and 3) intelligent parcel execution.



**1. CONFIGURABLE BUSINESS
RULE INSTRUCTIONS**



**2. ONBOARD OPTIMIZATION
ENGINE**



**3. INTELLIGENT PARCEL
EXECUTION**



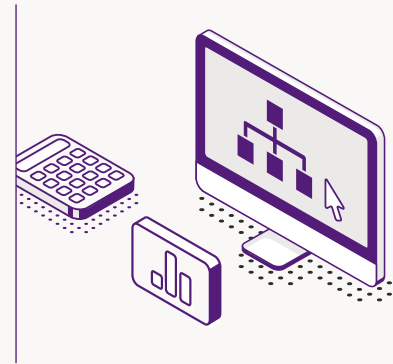
1. Configurable business rule instructions

Given the constant business changes in eCommerce fulfillment and evolving digital transformations, agility and flexibility are crucial. But legacy parcel systems were developed in an era when the ability to manage change was not as critical as it is now. Legacy systems use hard-coded scripted business rules to rate shop and make other simple decisions. Expensive customizations and long project timelines limit the ability of logistics managers to adapt to an ever-changing eCommerce environment. Moreover, scripted business rules have typically been applied at the point of shipping, now way too late in the process.

By contrast, Sendflex parcel TMS provides wizards to make it easy for non-programmers to configure [no-code, business rule instructions](#), thereby shifting control of complex logistics decisions from IT engineers and outside consultants to logistics managers. What used to take weeks of programming, can now be accomplished in minutes, significantly shortening time to benefit, while eliminating development costs.

More importantly, as volatile business conditions shift, routing, cartonization, and fulfillment instructions can be modified and adjusted on the fly, ensuring a more agile parcel management operation that optimizes day-to-day carrier decision-making, immediately contributing to long-term cost savings and delivery performance improvements.

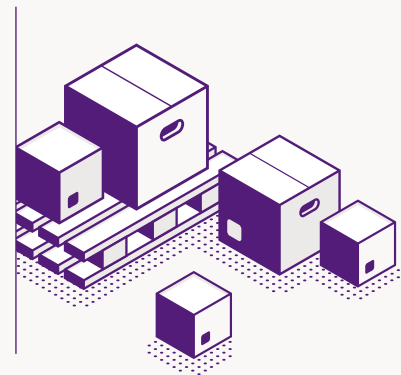
2. Onboard optimization engine



Carrier APIs have long been the industry “go-to” for rating parcel shipments. But they were never intended to support iterative analyses or for making cost-effective decisions at the speed of modern eCommerce. Internet latency makes carrier APIs too slow and unreliable. Moreover, carriers are known to throttle down API performance during peak periods, just when they are needed most. In addition, carriers don't like their technology assets exploited for “rate shopping”. As a result, shippers are now finding unexpected “API overuse” surcharges on their carrier invoices.

Sendflex parcel TMS [replaces carrier APIs](#) with a high speed, onboard optimization engine that processes over 20,000 carrier rate calculations, time in transit determinations, and optimization instructions per second. Augmented with cartonization intelligence, Sendflex determines the most transportation cost-effective way to pack and palletize orders. Unexpected fees like dimensional weight adjustments or unnecessary use of premium services can be minimized further upstream from the point of shipping, bolstering margins, sustainability benchmarks, and customer delivery experiences.

3. Intelligent parcel execution



Sendflex not only automates high-speed weighing, rating, and labeling at the point of shipping execution, but also dynamically monitors workflow activities in real-time and applies instructions which enforce logistics management carrier management strategies.

Parcel TMS simulators: gaining crucial insights via “digital twins”

The high performance and AI capabilities offered by Sendflex opens the door to optimizing fulfillment processes more holistically than legacy shipping systems which typically operate on a single-transaction basis. That is because legacy shipping systems were designed primarily to process individual shipping transactions and print labels at the end of a conveyor. By that time the window for cost-effective routing, cartonization, or planning has already closed.

By contrast, Sendflex harnesses its high-speed optimization engine to look across many orders at a time to generate cost effective shipping plans. But Sendflex can also look across historical shipping data and run "what if" simulation models, changing assumptions and variables such as carrier service, carton type, shipment attribute, customer preference and so on to measure impact on cost, capacity, and delivery performance.

While IT professionals have long been able to rigorously test technical innovations in sandbox environments before deployment, their logistics management counterparts haven't had it so easy. Instead-developing new supply chain strategies often relies on time-consuming pilot tests and rollouts, processes that are not only expensive but also fraught with disruption risks. It's like a high-wire act without a safety net.



While IT professionals have long been able to rigorously test new systems in sandboxes and virtual environments before deployment, their logistics counterparts haven't.

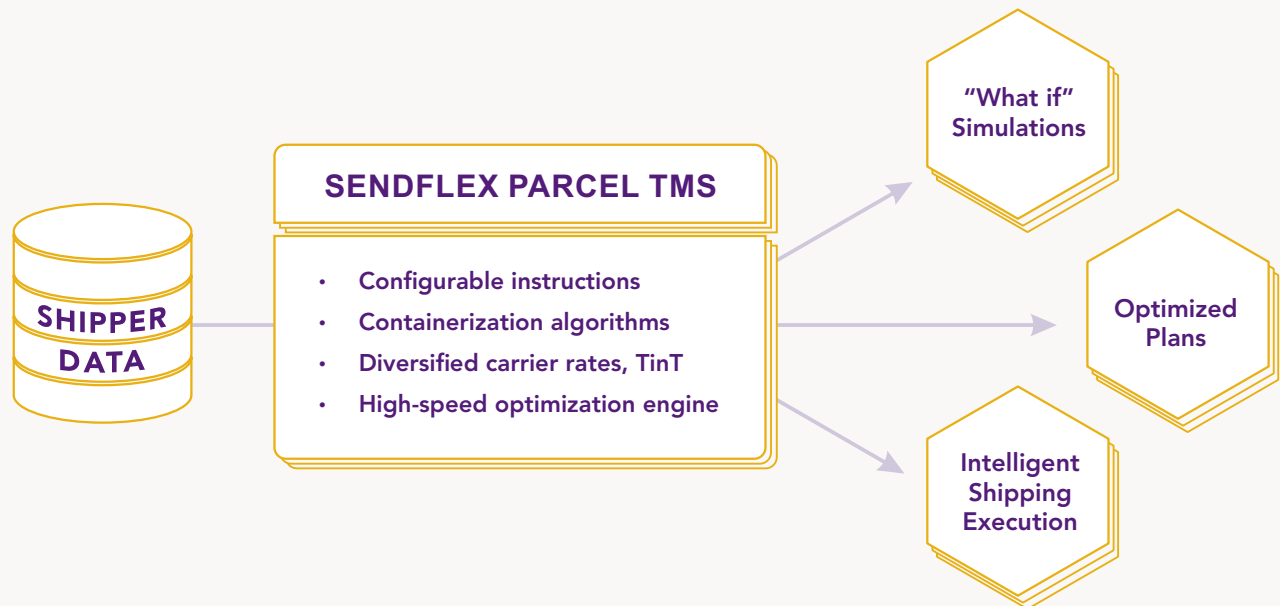
Simulations are in effect “digital twins”, virtual “what-if” scenarios that can be used to iteratively test digital transformation strategies, all without having to ensure the costs and disruption risks pilot programs incur in the physical world. Lessons learned from simulations can be more thoughtfully applied to subsequent optimization planning.

Simulators are essential tools that every logistic managers should have at their disposal for the same reasons sandboxes are critically important for IT professionals to test their work product. By comparing actual historical data with the virtual what-if simulations of digital twins, the door is open for logistics managers to gain continuous improvement insights that can be realized with optimized parcel planning.

Sendflex parcel TMS simulator simplifies the complexities of [B2C shipping](#), providing the means to run and compare alternative delivery models that are only limited by the imagination and strategic vision of logistics managers.

“What if” simulation modeling possibilities are virtually endless

THE FOLLOWING ARE EXAMPLES OF THE DIGITAL TWINS A SENDFLEX PARCEL SIMULATOR CAN GENERATE.



1. Rate change impact

Major parcel carriers release GRIs annually, but rarely do GRIs reflect the true (effective) cost impact rate changes will have on individual shipper circumstances. Effective rate increases are usually significantly higher once you have accounted for [parcel shipping surcharges](#).

Historically shippers have been outgunned by the superior data access and analytic tools available to carriers. But now, using Sendflex's simulator, a logistics manager can apply GRIs against historical shipping transactions and objectively measure the effective rate increase based on real-world data. Armed with this information, logistics managers can then use Sendflex to adjust routing instructions and carrier service selection criteria in the planning process to minimize cost impacts. But more importantly, they can more accurately measure the impact that GRIs will have on margins.



2. Adding an alternative carrier

With the risks of eCommerce-driven delivery disruptions higher than ever, logistics managers need to consider diversifying their carrier options by adding alternative carriers, zone skipping services, or new 3PL fulfillment nodes. However, there is often a significant and legitimate concern about how carrier diversification will actually impact cost and delivery performance. Will shippers lose the tiered incentives negotiated with their primary parcel carrier if they use alternative carriers?

Sendflex can easily run simulations to determine what a change in alternative carrier services would mean in terms of cost and delivery times. Just change the carrier routing instructions (delivery area, customer preference, time in transit, shipment size and weight, etc.), run it against historical data, and objectively measure parcel costs and delivery times for qualifying transactions. Best of all, configurable instructions can take tiered volume discounts into account, thus providing controls to balance carrier network diversification while ensuring valuable primary carrier incentives are achieved.



3. Carrier pickup caps

During peak seasons, large parcel carriers will often impose pickup caps to ration capacity. Exceeding these caps can lead to punitive surcharges, adding unexpected costs to shipping operations, or worse, leaving parcels on the outbound dock.

By using Sendflex simulations, logistics managers can accurately project the financial and practical impact of carrier pickup caps. Sendflex assists in determining what would happen if volumes which would normally be assigned to the primary carrier were rerouted to alternative carrier services. Simulation instructions could strategically select those orders which would be best suited for the primary carrier based on cost, service, consignee, customer preference, or any number of other variables. This ensures not only effective capacity management but also the realization of incentive tiers with the primary carrier.

Sendflex uses cartonization algorithms to maximize utilization of existing capacity thereby avoiding exceeding carrier pickup limits.



4. Dimensional weight adjustments

It's a common scenario: a customer receives a shipment in a box that seems excessively large for the item inside. Carriers use dimensional (dim) weight adjustments to compensate for "wasted" volume in their linehaul and P&D equipment. As a result, poor packing habits can inflate carrier invoices by as much as 10%, substantially increasing shipping costs.

Rather than leave packing methods to rules of thumb or general volumetric rules, Sendflex applies cartonization algorithms to line-item order data to simulate potential cost savings if more controlled packing controls were implemented. How much could I have saved if orders were packed more effectively? How might costs vary with alternative carton sizes? How could different packing methods reduce damage and returns? What if I used an alternative carrier with a more generous dim factor for specific SKUs?

Based on simulation insights, companies can make better-informed decisions by applying parcel orchestration instructions during order allocation and fulfillment planning processes.



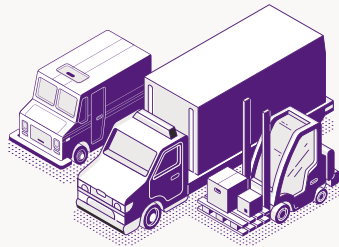
5. Performance-based carrier selection

Choosing a carrier based solely on cost will usually miss the mark in terms of overall value and service quality. Some carriers simply provide better services under certain circumstances than others. Traditional TMS carrier "report cards" offer some insights into performance but usually don't facilitate real-time, data-driven shipping decisions. They can diagnose but they can't operationalize fixes.

When it comes to factoring in carrier performance, Sendflex puts a thumb on the scale by applying value cost coefficients during route optimization processes. For example, simulations could "demote" a carrier service in rank based on their higher damage claim incidence for certain SKUs. Or change rank based on missed deliveries to specific ZIP codes. A carrier's base rate might be \$10.00 per shipment, but when performance costs are factored in (the cost of returns, administrative intervention, customer satisfaction issues), the effective rate might climb to \$11.50. Sendflex simulations account for these nuances, re-ranking carriers to provide a more granular and meaningful view of which carriers to use, ensuring that both cost efficiency and quality of service are optimized.

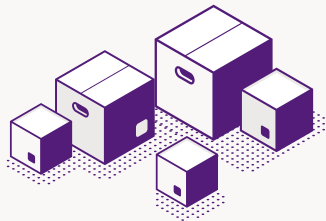
Who Can Sendflex's Simulator Help?

Parcel TMS simulators are not exclusively reserved for shippers. While they undoubtedly equip logistics teams with the tools to fine-tune their parcel shipping strategies and make data-driven decisions without relying on IT, consultants, or data scientists to do the heavy lifting, parcel TMS simulators offer a multitude of benefits to various other stakeholders in the supply chain.



TRANSPORTATION SERVICE PROVIDERS

With parcel TMS simulators, carriers, brokers, consolidators, and zone skip service providers can objectively present the benefits of using their services to shippers instead of incumbent service providers, thus accelerating their sales cycle.



PACKING MATERIAL VENDORS

By employing cartonization simulations, these vendors can show how alternative carton sizes can minimize material waste and improve transportation metrics, ultimately promoting efficiency and sustainability.



3PLs

Leveraging simulations, [third-party logistics providers](#) can demonstrate the advantages of using alternative distribution centers or their specific carrier brokerage services in optimizing costs and delivery performance.



CONSULTANTS AND SYSTEM INTEGRATORS

As organizations contemplate the rollout of new enterprise systems, simulators provide a quantifiable value assessment, grounding their business case and spend management recommendations with data-driven ROI analyses. And then an path for realizing those ROIs.

From shippers, to suppliers, to carriers to consultants, players in the supply chain ecosystem can harness their capabilities to bolster data-driven decision-making and ensure automation of cost-effective operations.

Unlock Intelligent Logistics with Sendflex

At a time when B2C fulfillment is becoming increasingly complex and shipping costs are rising, it simply makes sense for logistics professionals to deploy systems to automate intelligent, real-time decisions which would otherwise defy human intelligence. They need a way to test new assumptions quickly and accurately in a risk-free, virtual environment, and then translate those insights into actionable planning processes to realize projected digital transformation benefits.

[Sendflex](#) stands at the forefront of this transformation, offering a state-of-the-art parcel TMS platform that empowers logistics experts to plan, simulate, and execute shipments across a diversified carrier network. Sendflex not only streamlines costs but also maximizes flexible resource utilization, elevating customer delivery experiences.



What if I had used a regional carrier last year? How would it have impacted costs and delivery times?



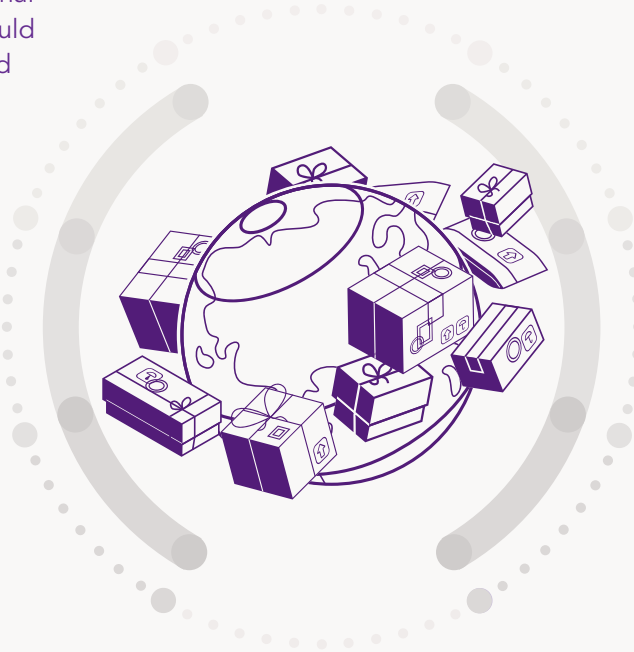
Will I save money by changing my mix of carton sizes?



How will a carrier's GRI and surcharges actually impact my total cost?



How can I avoid unexpected surcharges?



What if I had shipped some of my peak season orders from a Reno fulfillment center?



How much money could I actually save by zone skipping?



Would using a 3PL fulfillment service in this region reduce costs?



What if I don't hit my tiered incentive?

Dive deeper into the world of simulations, advanced optimization, and data-driven logistics with Sendflex

Whether you're looking to demonstrate ROI, streamline processes, or enhance delivery experiences, our experts are ready to guide you. [Schedule a consultation](#) with a Sendflex specialist and embark on your journey toward intelligent logistics.

You need data-driven decision-making throughout your order fulfillment to delivery process.

The Sendflex Simulator provides critical insights in just 5 steps:

1. SELECT SHIPPING HISTORY

Simulator lets you apply different assumptions against historical shipping data to test and compare “what if” scenarios.

2. IMPORT CARRIER RATES

Instead of relying on slow and unreliable carrier rating APIs, Sendflex features an on-board, high-speed rating, time in transit, and routing engine.

3. CONFIGURE DECISION INSTRUCTIONS

Use no-code wizards to configure decision instructions based on a wide range of criteria including preferred carrier services, delivery promises, shipment attributes, etc.

4. RUN AND COMPARE SIMULATIONS

Reprocess historical data applying decision instructions and recalculating cost and delivery metrics based on alternative rates - output details and summaries.

5. IMPLEMENT EXECUTION PROCESSES

Once you have determined the best shipping strategies, apply those same simulation instructions during quoting, order allocation, fulfillment, and shipping processes.

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