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Whitepaper

Overcoming Challenges IN LAST-MILE DELIVERIES

Addressing last mile delivery challenges in Mexico operations for a large beverage retailer.

Shwetank Kulshrestha



Abstract

Last-mile, is often the most challenging and inefficient piece of the logistics puzzle in any business. It is widely reported that around 28% of the total delivery cost to a business comes from the last mile. The complexity lies in the fact that a large number of customers need to be serviced within the tight delivery windows while keeping delivery costs low.

This article provides insights into the challenges and solutions for addressing the last-mile delivery problem for a beverage retailer.



Challenges

The distribution network of the beverage retailer highlights the complexity of the last mile network with multiple client locations to be serviced within firm delivery timelines. This is just the snapshot of one route out of more than a hundred such routes in the fulfillment network (with each route having an average of 50 client locations) of the customer through which the fulfillment happens daily. The unpredictable traffic and road conditions lead to delay in the deliveries. It is crucial to plan the routes efficiently. Without efficient routes, drivers would not know the best way to get to customers, resulting in frequent late deliveries.

The very nature of the last mile problem poses challenges for the routing optimization software to calculate the most optimal solution. In addition to this, there are many other variables to consider during optimization.





Adhering to the Various Business Rules of not Mixing Certain Orders in a Load Which Further Adds to the Complexity

The last mile network of this retailer consists of a large number of customer locations, many of which are closely located. There are many customer locations which are in the vicinity of each other hardly 10m apart, and each truck has to drop shipments at many stops within a single trip. In such a scenario, the question arises "Should the goal of the route optimizer be to find the routes based on minimizing the mileage only?"



Opportunity

As observed in many cases, it was possible to achieve incremental distance savings by relaxing some constraints. However, the savings got offset due to other costs, like the cost of using the vehicle, labor costs, accessorial costs, etc. Thus, leading to increased overall costs. The reason is the increase in the number of routes (loads) or lesser double trips while minimizing the distance, which needs more vehicles and the associated labor for servicing and maintenance.

For example, the cost per kilometer of distance travelled is in the range of USD 0.5 and fixed cost of labor and vehicle per day is in the range of USD 100. Therefore, if the company is planning different scenarios for routes optimization and if in the base scenario, total distance travelled is X km then there have to be at least minimum savings of 200 km in the alternate scenario to justify the savings in case fixed costs increases if it is minimizing based on distance only.

There is a clear trade-off between the mileage savings and the savings from the other types of costs. Thus the ideal solution is to use cost-based optimization to minimize the total cost while finding the optimal route and effective resource utilization. Another critical component in optimizing last-mile delivery is the

distance engine which fetches the distance between the pair of locations. Last mile scenario involves the multi-stop delivery along a route and multiple shipments in a day which implies multiple calls by the distance engine within the optimizer to fetch distance between all the possible pairs of locations in order to plan the routes for a particular day in the most optimal way. To give an idea, there are more than 5000 orders (locations) each day which will require around 15 million distance calls for a single day planning.

Thus the last mile scenario creates an additional requirement on the performance of the optimizer. Hence, it needs fine-tuning for optimal performance. Moreover, as the distances between the locations approach zero, the distance engine needs to relay the distance with greater precision.

In addition to this feature of distance relay, it will add immense value if it can also deliver insights to optimizer such as street level rules like:

- One-way driving, weight, or size restrictions for vehicles on certain routes
- The applicable speed for that stretch depends on the road/ traffic conditions or if a particular stretch between any two locations can be better serviced by walking or driving the truck

Most of the off-shelf distance engines only provide transit time based on the driving and not based on walking, apart from Google. For example, in a particular case involving 2 locations (plotting with the help of Google Maps), it was found that the driving distance between those locations was 550 m, whereas the actual walking distance was hardly 10m. This difference is of considerable magnitude in the case of last mile deliveries. With this insight, it is possible for the crew to deliver to these locations simultaneously while avoiding the extra travel and resources.





Providing visibility to the customers over the entirety of the last mile is one of the key challenges. Customers want to know where exactly the driver is and exactly when he will arrive. Hence, companies want to enable this visibility and improve customer service, and also manage any untoward events by sensing them early on and respond quickly through pre-planning.

It entails a real-time monitoring system that can consume execution events (real-time feed from GPS) such as current location, revised ETA, driver checking/checkout, etc. Further, it can automatically compute the impact of execution events on future activities and reschedule those future activities while flagging any violations. Thus leading to improved resource utilization and customer service by taking advantage of the early visibility of the revised schedule.



Conclusion

With the ever-increasing customer expectations, it is important to adhere to dynamic and strict delivery windows successfully. These places challenge the customer to identify the optimal route that can meet these delivery windows while meeting all the constraints discussed above and also reduce the overall cost to serve within the available working hours of the day.

Delayed deliveries irate the clients and degrade the customer experience. The solution is to address other factors such as the priority of customers (in case of any conflict) to make the correct sequencing decision. Thus, with well-optimized routes, correct technology intervention, proper visibility into execution, and the last mile deliveries can be made efficient.

About us

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Shwetank Kumar Kulshrestha is a CSCP certified professional with over 9 years of experience in the areas of transportation and supply chain solutions. He can be contacted at shwetankkulshrestha@smartlinkstech.com





SL4 TECHNOLOGY INDIA PRIVATE LIMITED Startup Huts, Unit-7, Ground Floor, #2739, 15th Cross, 27th Main, Sector-1, HSR Layout, Bangalore, KA, 560102, India



India: +91 814 580 1191

☑ contact@smartlinkstech.com



www.smartlinkstech.com

