

Last mile delivery

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Keynote

Abstract

Last mile delivery is one of the most complex processes in the whole logistics process. This is because it involves many uncertainties, such as weather conditions, road conditions, traffic, car accidents, delivery vehicle anomalies, choice of route, avoiding parcel damage and delivery errors, and communication with the retailer or the recipient of the parcel; all this makes the successful delivery of parcels at the customers' doorstep difficult. In addition, today's consumers have much greater expectations regarding delivery services, they demand to receive their parcels much faster or be able to choose the time and place of delivery. All this increases the cost of last mile delivery, accounting for 40% of overall supply chain costs.

E-commerce giants such as Amazon can invest a large number of resources into creating optimal last mile delivery solutions, establish numerous warehouses throughout countries which enable them to store the parcels as close to the end user as possible. However, companies that do not have as many resources may find it difficult to satisfy the delivery expectations of their customers; longer and inflexible waiting times, as well as additional payment for delivery may cause companies to quickly lose competitiveness on the market. This means that companies must turn to technological solutions that are going to help them to improve their last mile delivery effectively but at a reasonably low price.

Big Data are the basis of all smart solutions. This is because collecting large amounts of data makes it possible to extract information and make future predictions on the basis of past patterns.

Data can be collected on many variables to help optimize last mile delivery:

- Given that every city's geographical and population distributions are different, it is necessary that companies obtain data the city's datasets on these variables. Furthermore, if a city has an implemented IoT sensor network deployed to monitor traffic, companies may use these real-time data to obtain knowledge of current traffic on specific roads, roadworks and accidents. Considering all this information, AI models can be applied to calculate the optimal route for drivers or modify the route in real-time in case any inconveniences are detected. This will help drivers avoid getting stuck in traffic jams and reach their destination faster.
- Implementing sensors in delivery vehicles will make it possible for the company to monitor their drivers on the route and reach out to them in case of any anomaly occurred, such as a malfunction in the vehicle.
- Collecting weather forecast information will help warehouses prepare for adverse weather conditions or inform the end-user of possible delays in advance. In the long-term, considering the weather in delivery is going to help prevent accidents on the road, prevent unexpectedly long waiting times for parcel delivery and increase customer satisfaction.
- The implementation of real-time data analysis will make it possible for companies to offer customers greater flexibility in receiving their parcels. In case customers change the place, time or day of delivery while their package is in the last mile, smart solutions will replan the delivery route of the vehicle in the most optimal way.

- Customer satisfaction with last mile delivery may be monitored through analysis of direct feedback provided by customers on the company's website or through the extraction of opinions from social networks. Analysis of such data will help companies identify common problems and address them.
- Data collection and analysis secured with the use of Blockchain, will enable companies to make their last mile delivery transparent to their customers. If a company is planning on lowering its carbon footprint through the gradual replacement of fuel powered vehicles to electric or hydrogen vehicles, technologies make it possible to provide evidence to customers of lower Co2 emissions, which helps build trust and customer loyalty.

Normally, technologies such as Internet of Things, Cloud Computing, Edge Computing and Big Data are involved in data collection, processing and storage. However, implementing all these technologies may not only be expensive but also requires hiring a multidisciplinary group of experts who will be able to advise the company on the best technological combination, implement the technological solution and manage it in the long-term. Additional expenditure will have to be allocated to training staff in the use of these technologies in the workplace. All this becomes overwhelming for companies, especially for those who have little or no experience with the use of technologies in their processes.

Fortunately, companies have access to a broad range of solutions on the market aimed at facilitating the task of implementing technologies in their processes. Deep Intelligence or Deepint.net is one such platform. It has been designed to considerably decrease the difficulties that businesses face in relation to implementing technologies in their processes and managing them.

Deepint.net is a readymade platform which can be adapted to meet the needs of any company in regard to any of their processes, including last mile delivery. Deep Intelligence comes with a complete suite of AI data analysis tools and can ingest data coming from heterogenous sources. This increases the companies' possibilities to analyze greater amounts of data and therefore, acquire more accurate knowledge. Moreover, it frees companies from having to implement all these AI technologies separately and thus saves costs and time. A wizard is available on the Deepint.net platform to guide users with no experience in data analysis through the data analysis process. This helps save costs on training and eliminate the need for hiring experts in data analysis.

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