Data Science
in
Delivery Logistics

Group 1

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Motivation

1. Improved Visibility, Growth Potential
2. Improved Operational Efficiency
3. Raising Profit Margins

Data Gathering

At every touchpoint, from a customer initiating an order to the final delivery of that order, large quantities of data are collected:

- Customer information
- GPS data
- Number and types of items
- Carrier data, delivery information
- And more

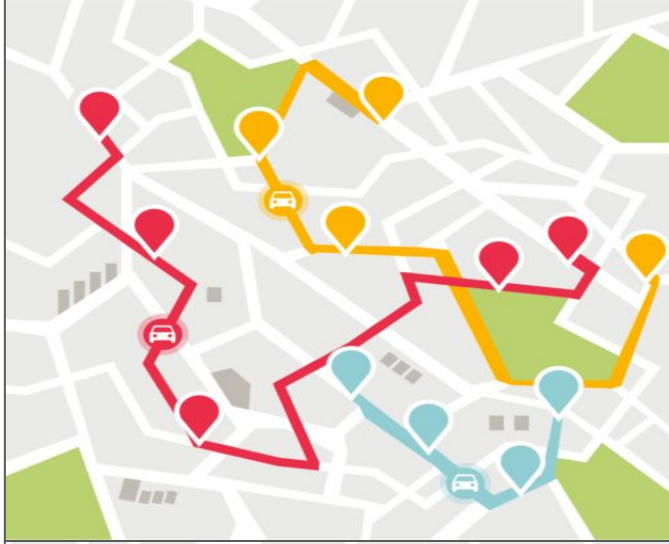
Applications

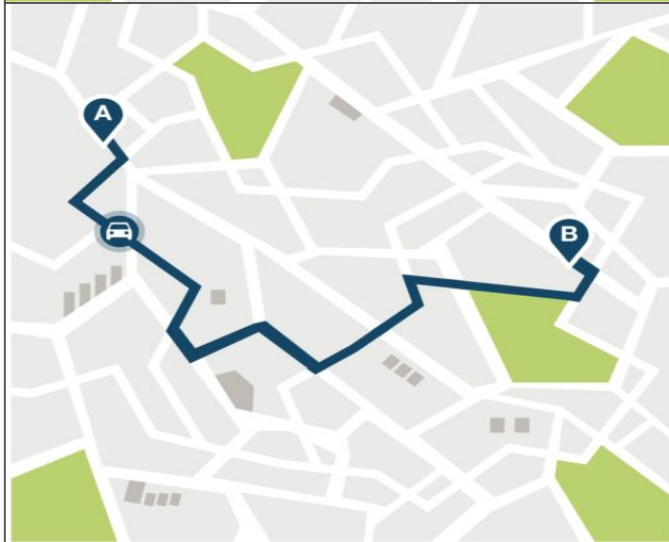
- Optimisations in Organisation Structure
- Route Optimisation in Delivery
- Large amounts of unstructured invoices
- Forecasting Demand for a product

Delivery Route Optimisation

Definition

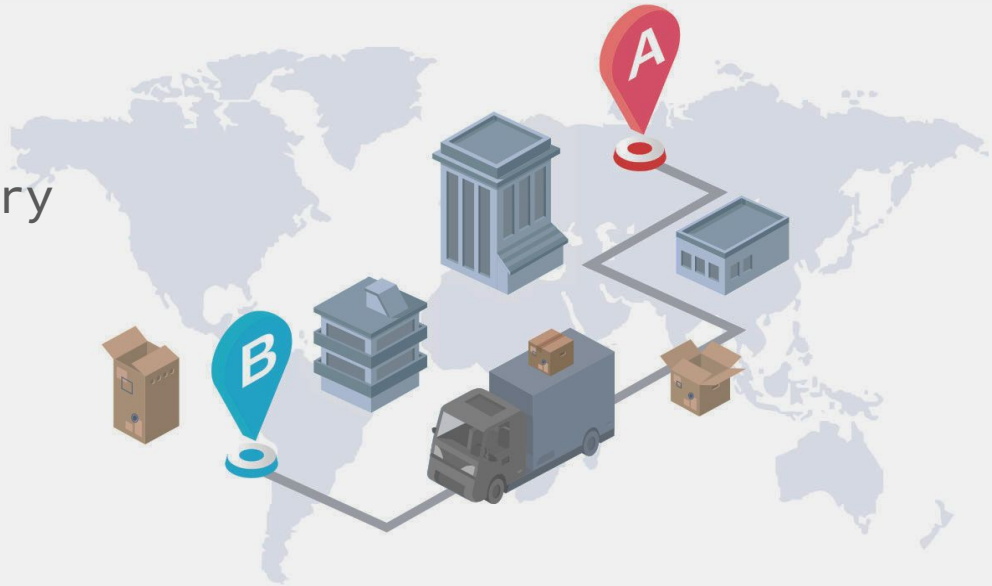
Route optimization is the process of finding the best route for delivery drivers to take to get a package from the transportation hub to its end recipient as quickly and cost-effectively as possible





Why Route Optimisation?

- Avoid late Shipments
- Decrease Cost of delivery
- Improved Vehicle Utilisation
- Save Fuel
- Improve Workforce Productivity



How to Solve ?

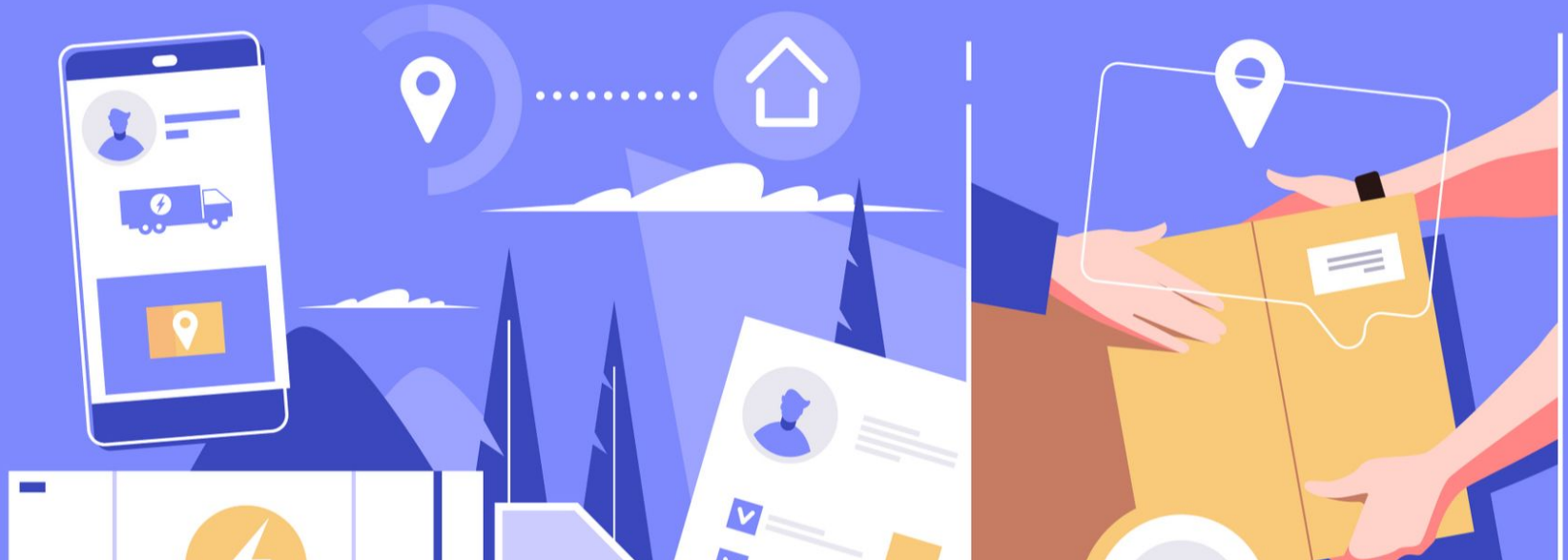
- Design a ML model
- Data Var include:
  - Speed
  - GPS location
  - Traffic
  - Weather
  - Destination
- Genetic Algorithm to plan the route of journey

Route Optimisation Algorithm

Real World Example

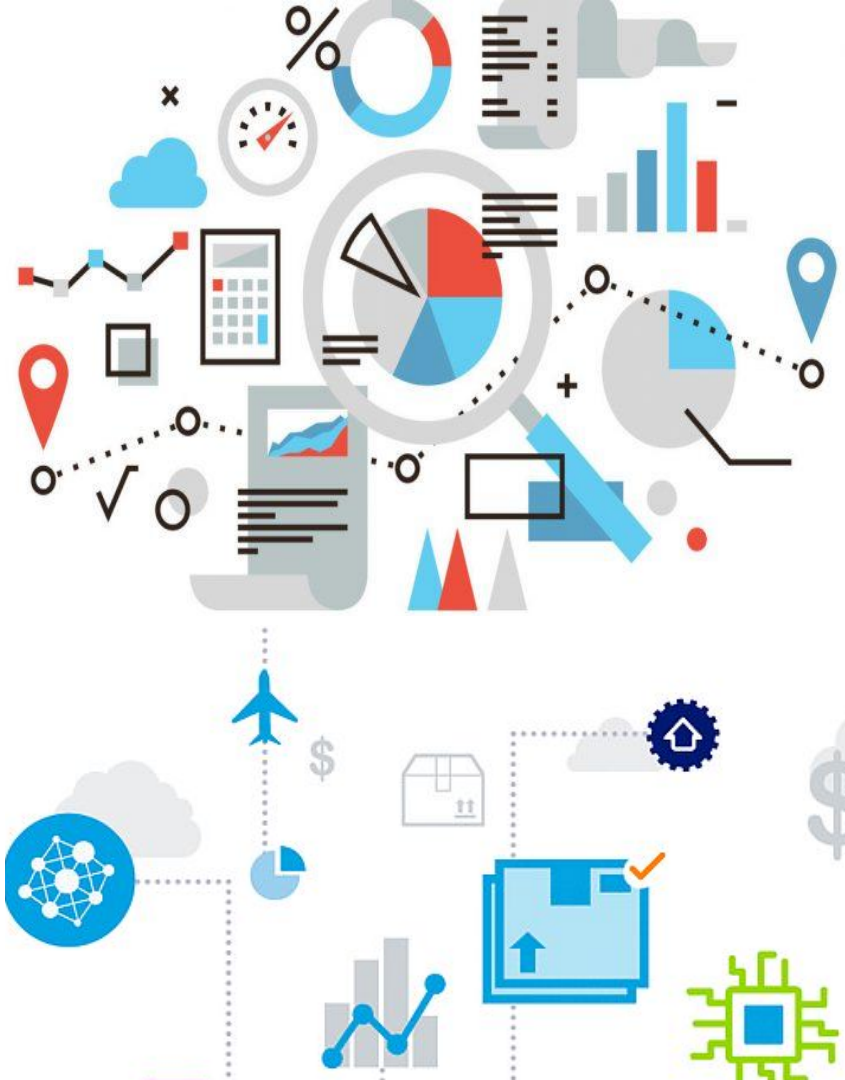
- UPS is a real-world case of big data logistics leading to big savings
- UPS is world's largest Logistic company.
- UPS uses Network Planning tool along with ML, AI and Big Data.

Operational Optimization



What is Operational Optimization?

Operations Optimization is the process of ensuring that your operations are performing as efficient and effective as possible.

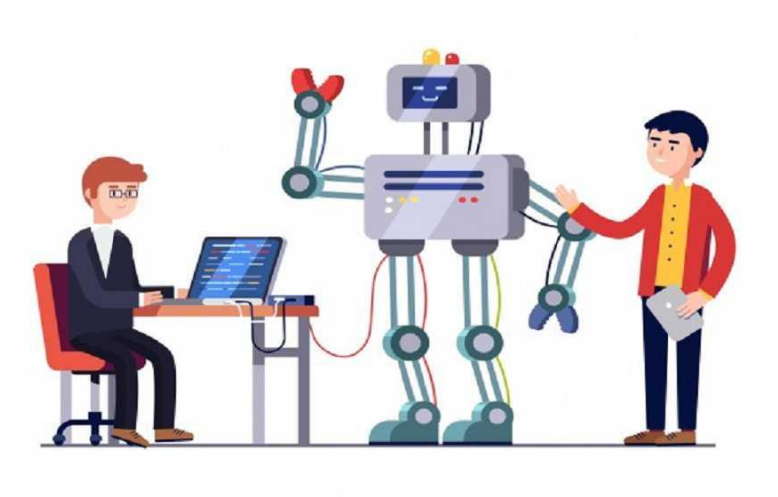


The Role of Artificial Intelligence

AI plays a pivotal role in saving time, reducing costs, increasing productivity and accuracy with cognitive automation. It allows us to save time and money because it helps in automating various time-consuming processes and helps in demand forecasting.

Role of Machine Learning

With the assistance of Machine learning the patterns in supply chain data are often discovered by counting on algorithms which may quickly pinpoint the foremost influential factors.



Impact of AI & ML

1. Access vital information such as billing amounts, account information, dates, addresses easily

2. Helps to analyse large sets of data

3. Makes logistics management smarter and better.

Demand Forecasting

What is demand forecasting?

Logistics Demand Forecasting is the process in which historical sales data is used to develop an estimate of an expected forecast of customer demand.

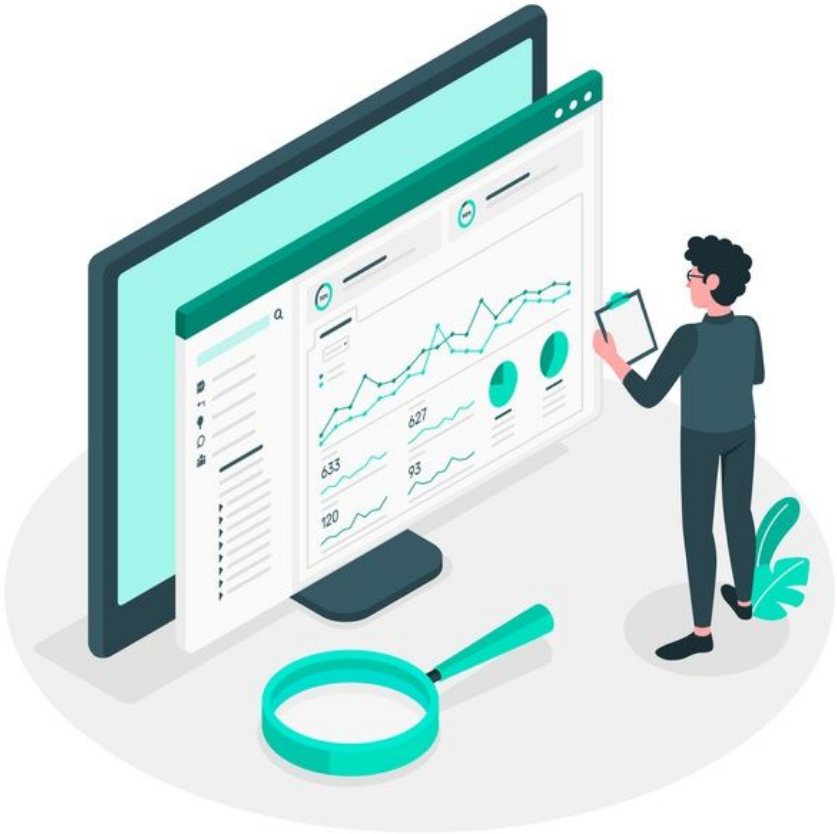
Why?

Logistics forecasting has multiple benefits

- Cost Reduction
- Increase Employee Efficiency
- Optimal Fleet Repositioning
- Selling Extra Logistics Assets
- Dynamic Pricing

How does it work?

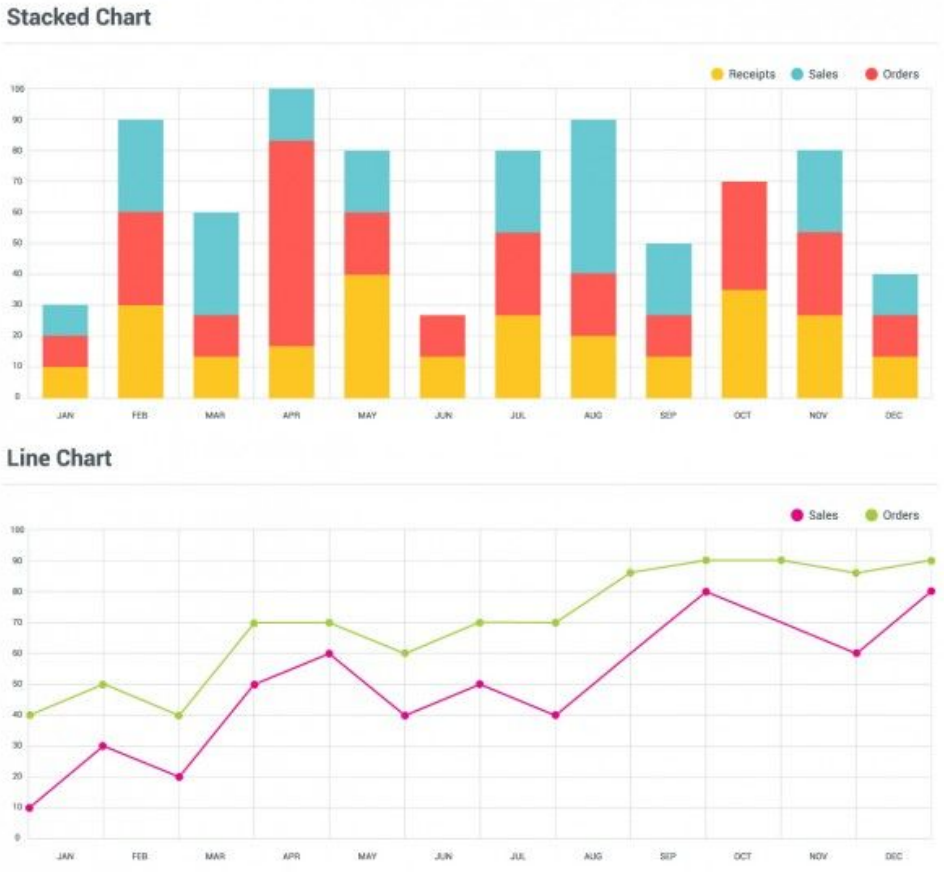
- Machine learning models learn trends and relationships from historic data of the business
- Historic data of the business with relevant variables/attributes is fed to the model
- To detect trends, it is necessary that the data is sequential



What does it predict?

Based on the last n data points of demand:

- What product will sell the most?
- How much quantity of each product will be required?
- Which products won’t sell at all?



Conclusion

With the extensive use of generated data, statistical and quantitative analysis, and predictive models, data science can enable enhanced insights, decision-making, and process automation. Throughout the years, data science has and will continue to help the entire industry drive down costs and improve operational efficiency.

References

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Thank You