

# Machine Learning in Supply Chain

Presented by:  
Nivedita Wasson  
May 2021

A forecast by Gartner highlights that By 2023, at least 50% of large global companies will be using AI, advanced analytics and IoT in supply chain operations.

In any supply chain there is a fundamental **trade-off** between the cost of transporting a given product (**efficiency**) and the speed with which that product is transported (**responsiveness**)

Responsiveness



Efficiency(cost)

## Efficiency(cost)

### Optimizing Production Plans

Using 'production data' to get insights about areas of 'waste and Inefficiency' using ML algorithms



### Warehouse Management

Using ML models for demand/supply forecasting for inventory management in warehouses to prevent under/over stocking



### Advanced Last mile tracking

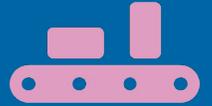
Data suggests that about 28% of all delivery costs are due to last mile delivery. ML can be helpful in optimizing delivery process by using data to understand patterns.



## Responsiveness

### Quality Control

Image recognition techniques with ML algorithms can be used to detect defects automatically and speed up the process



### Enhancing Customer Experience

Using ML for market basket analysis and IOT devices for supply chain visibility can augment customer experiences by leading to faster delivery commitments



### Fraud Prevention

By automating inspections and auditing processes followed by performing real-time analysis of results to detect anomalies in the supply chain. Also used for preventing privileged credential abuse to prevent security breaches.



## EXAMPLES:

Amazon is using AI at fulfillment centers where robots shuffle 'pods', algorithmically, inside Amazon's giant warehouses. AI & algorithms work relentlessly to optimize the delays and efficiencies of product movement using the combination of Robots, Pods and Associates towards the goal of speedier product delivery

Amazon Web Services (AWS) is using machine learning primarily to forecast demand for computation.

Amazon Go is Amazon's cashier less grocery which uses a bank of video cameras to figure out what items the shopper is picking up and bills accordingly.

The Amazon logo is displayed in white text on a dark grey rectangular background. The word "amazon" is in a lowercase, sans-serif font. Below the letters "a" and "z" is a curved orange arrow that starts under the "a" and points towards the "z".

## EXAMPLES:

Brillio implemented an **AI powered – Real Time Vendor Transaction Anomaly Detection** Solution for a Pharma company based out of New York, with valuation of over \$USD25 Billion and headcount over 20,000.

It is used for potential fraudulent vendor transactions can be identified and profiled in near real-time, thereby enabling rapid intervention. This solution also provided quantification of risks associated with adding new vendors, which tend to bring more risk.



The 4 pillars that form the crux of this AI Solution are as following:

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### 1. Audit Execution

- Build Clustering models to identify potential anomalous transaction clusters
- Apply statistical techniques on these identified clusters to derive key indicators of fraud
- These key fraud indicators are then leveraged to produce the final fraud risk score

### 2. Continuous Tracking

- Continuous vendor tracking to provide early warning signals about new vendor activities.

### 3. Onboarding

- Assignment of a risk score to new vendors based on statistical similarity with existing ones

### 4. Automated Model Refresh and Maintenance

- Periodical refresh of the Machine Learning (ML) models with human-feedback loops



## EXAMPLES:

Swiggy is using AI to deliver a personalized discovery experience — be it catalog intelligence, customer intelligence, relevance and personalized customer experience and real-time signals (last-mile distance between the restaurant and customer location)

On the restaurant side, it is using AI for time-series based demand prediction models that help its partners plan ahead for demand.(production planning)



## Next steps for AQ4

AQ4 can use its expertise in the supply chain and warehouse management systems in future with AI and ML integrated new technologies.

AQ4 can make enhancements to its product STEER and TANGO for customers with custom AI and ML solutions by focusing on the areas discussed.

## References:

<https://www.gartner.com/smarterwithgartner/gartner-predictions-2019-for-supply-chain-operations/>

<https://www.economist.com/business/2019/04/11/amazons-empire-rests-on-its-low-key-approach-to-ai>

Thank You