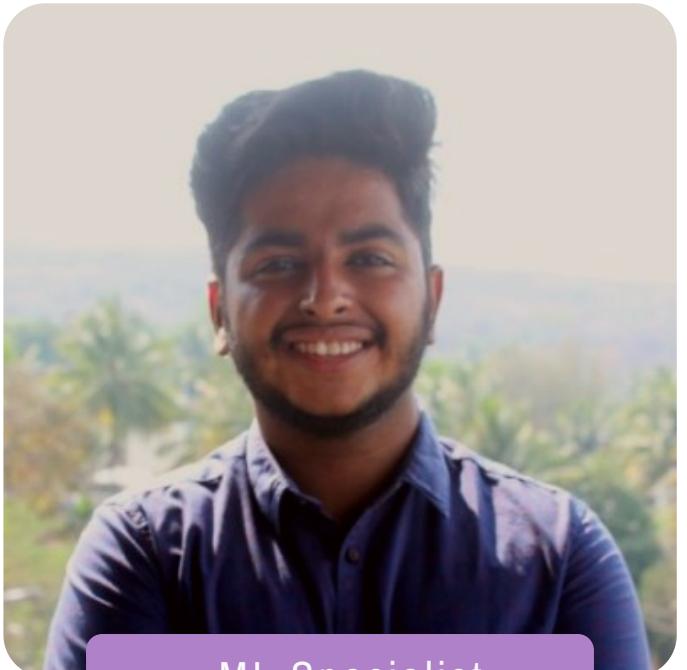




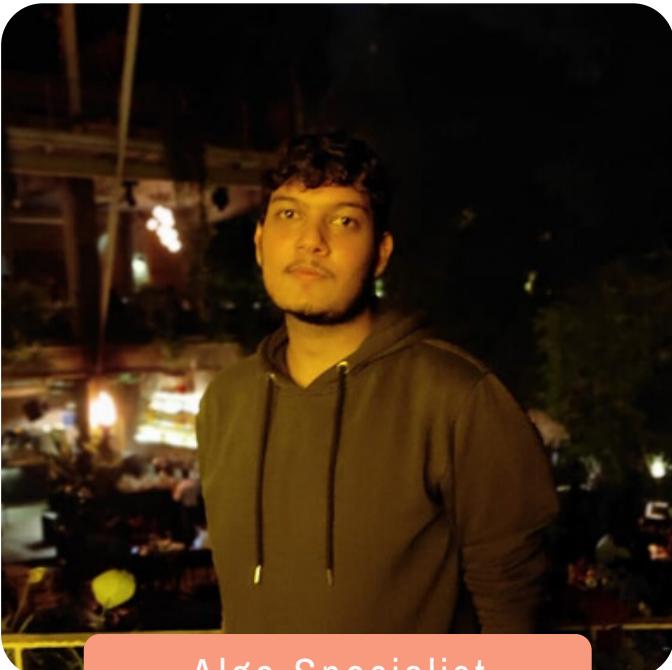
TEAM MEMBERS



ML Specialist

Rithuraj Nambiar

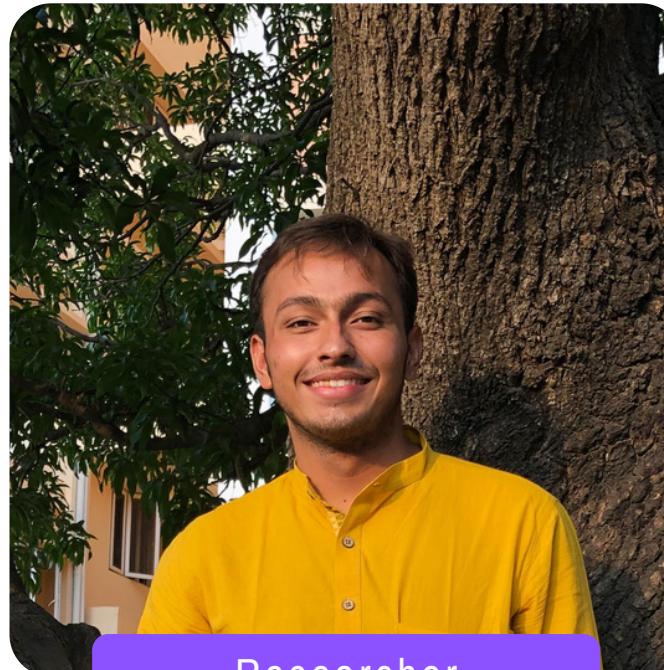
Technical Team Lead at AI Club,
VIT Bhopal, ML Intern at Bluepen



Algo Specialist

Vedanshu Sharma

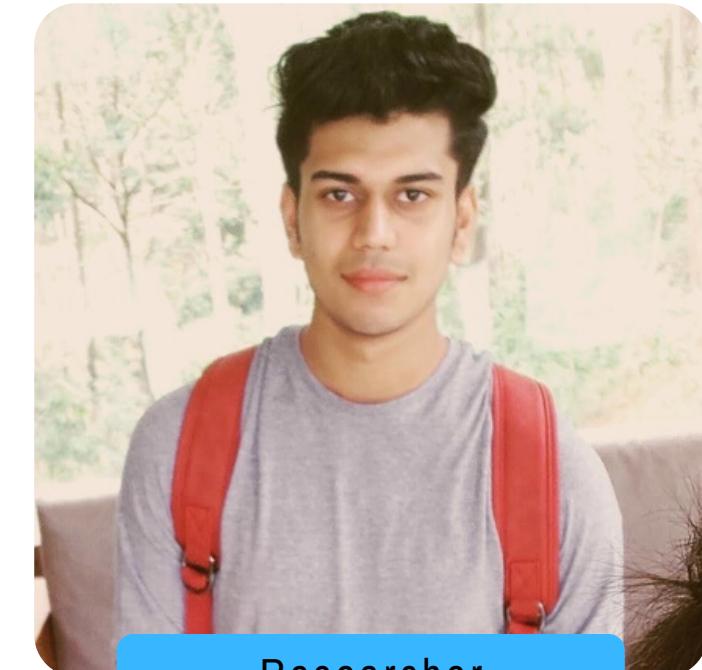
Ex-Power Train Team Head at
Team GarVIT, VIT Bhopal



Researcher

Aryan Tiwari

Strong hold over Data
Structures and Algorithm

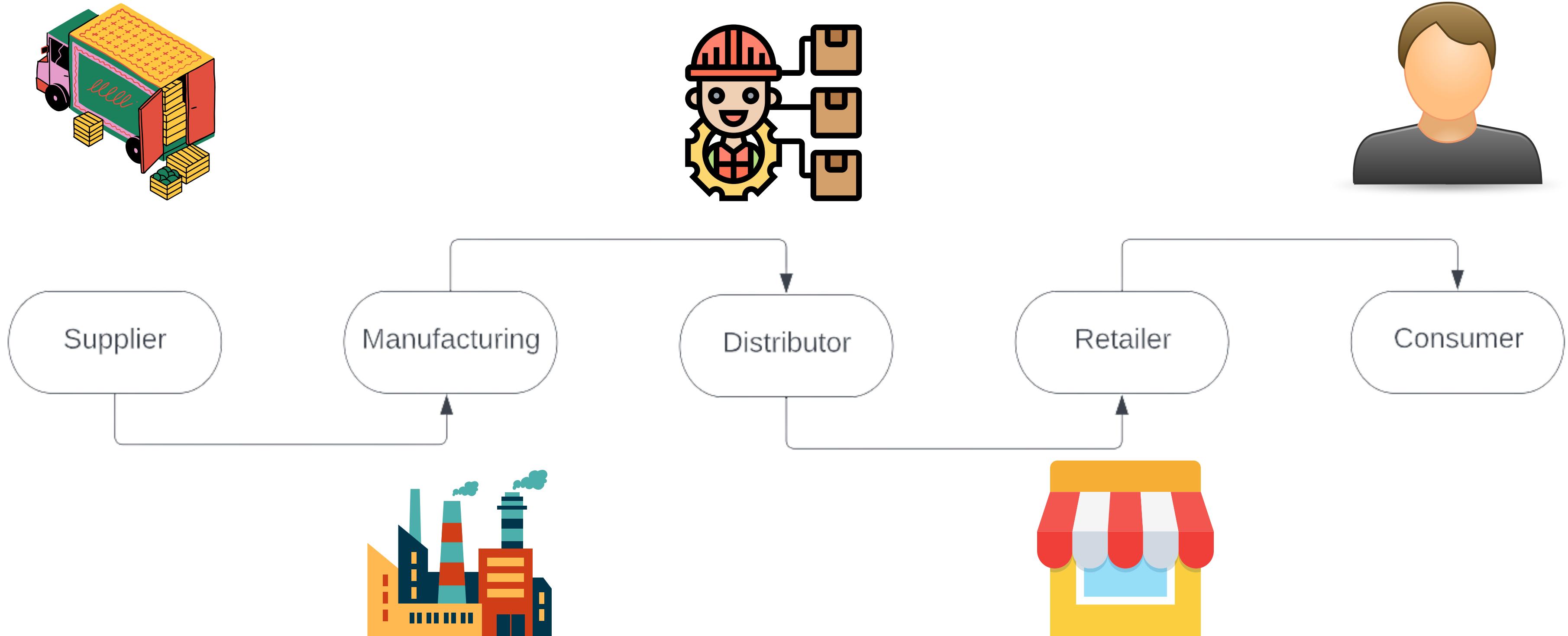


Researcher

Saksham Gupta

Ex-Social Media Team Lead at
Team GarVIT, VIT Bhopal

TRADITIONAL SUPPLY CHAIN CYCLE



INDUSTRY RESEARCH

We have talked to two industrial personnel to get professional opinion about the challenges and opportunities in Supply Chain Management!



Rajeevan
Nambiar
DGM West -
Bambino Pasta

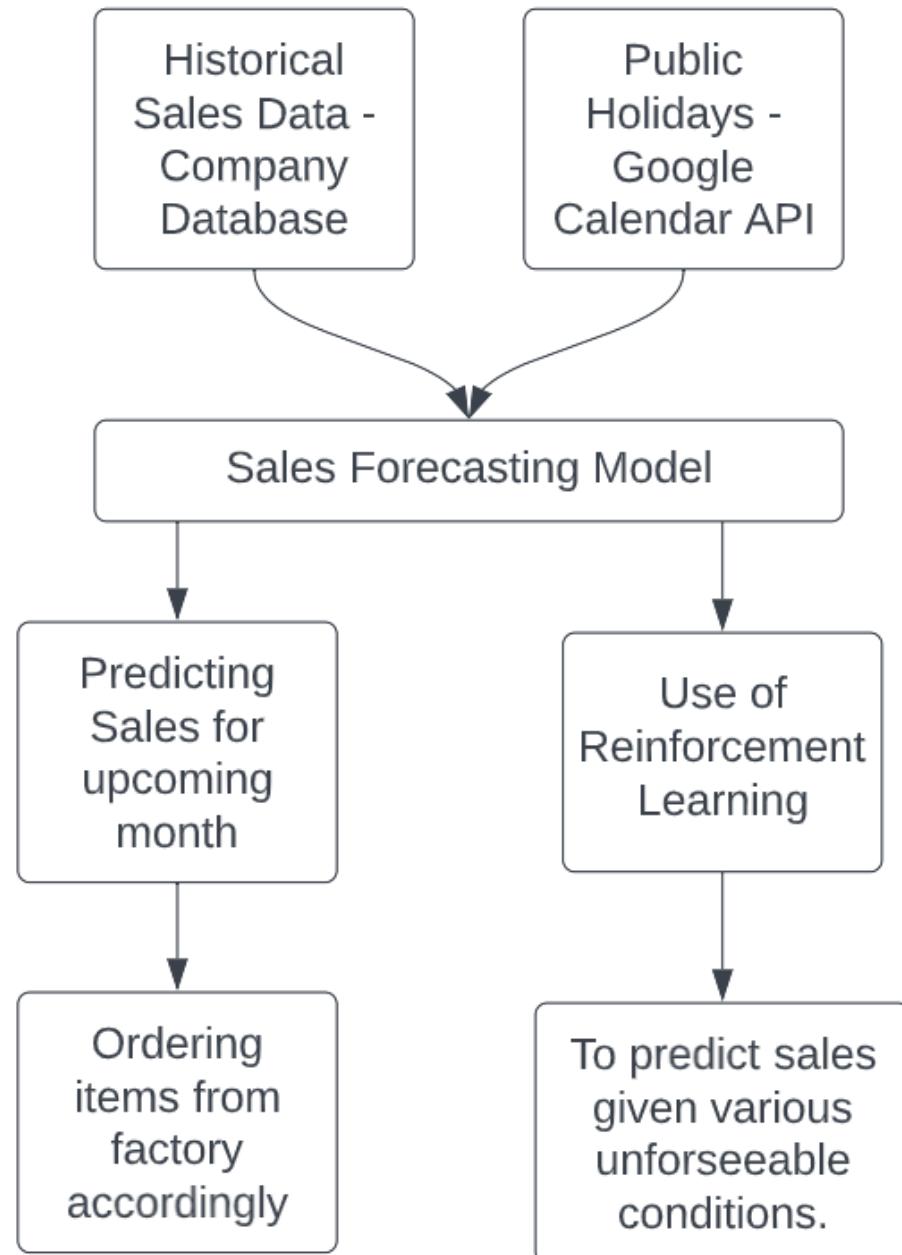
- Increased prices due to costly logistics
- Delivery of old stock, creating consumer issues
- Maintaining hygiene in warehouses and factories



Thom Ives
Sr. Data
Scientist -
Echo Global
Logistics

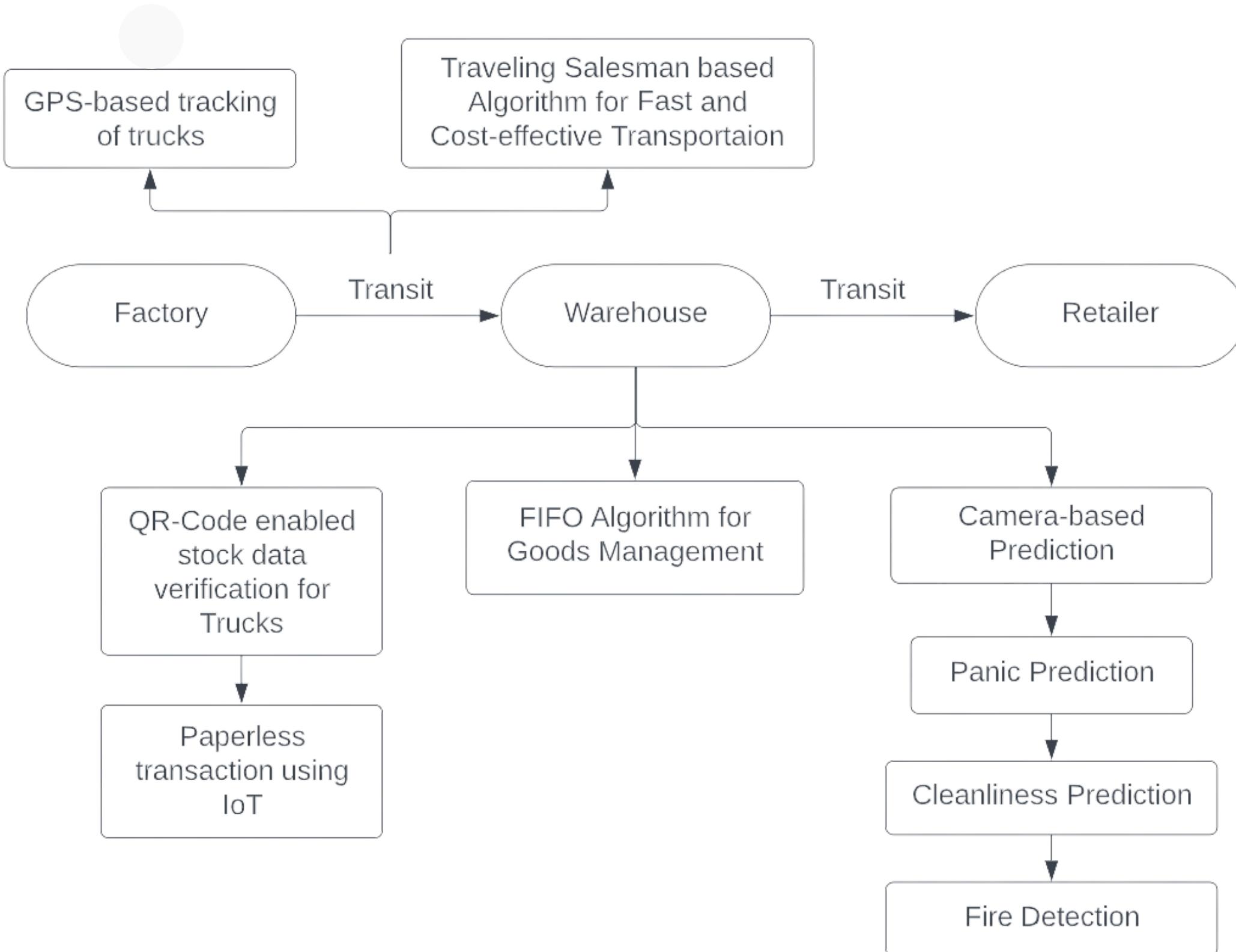
- Pyomo can be used for optimizing supply chain problems
- AI and Supply Chain has lot of potential to be harnessed

SALES FORECASTING SYSTEM



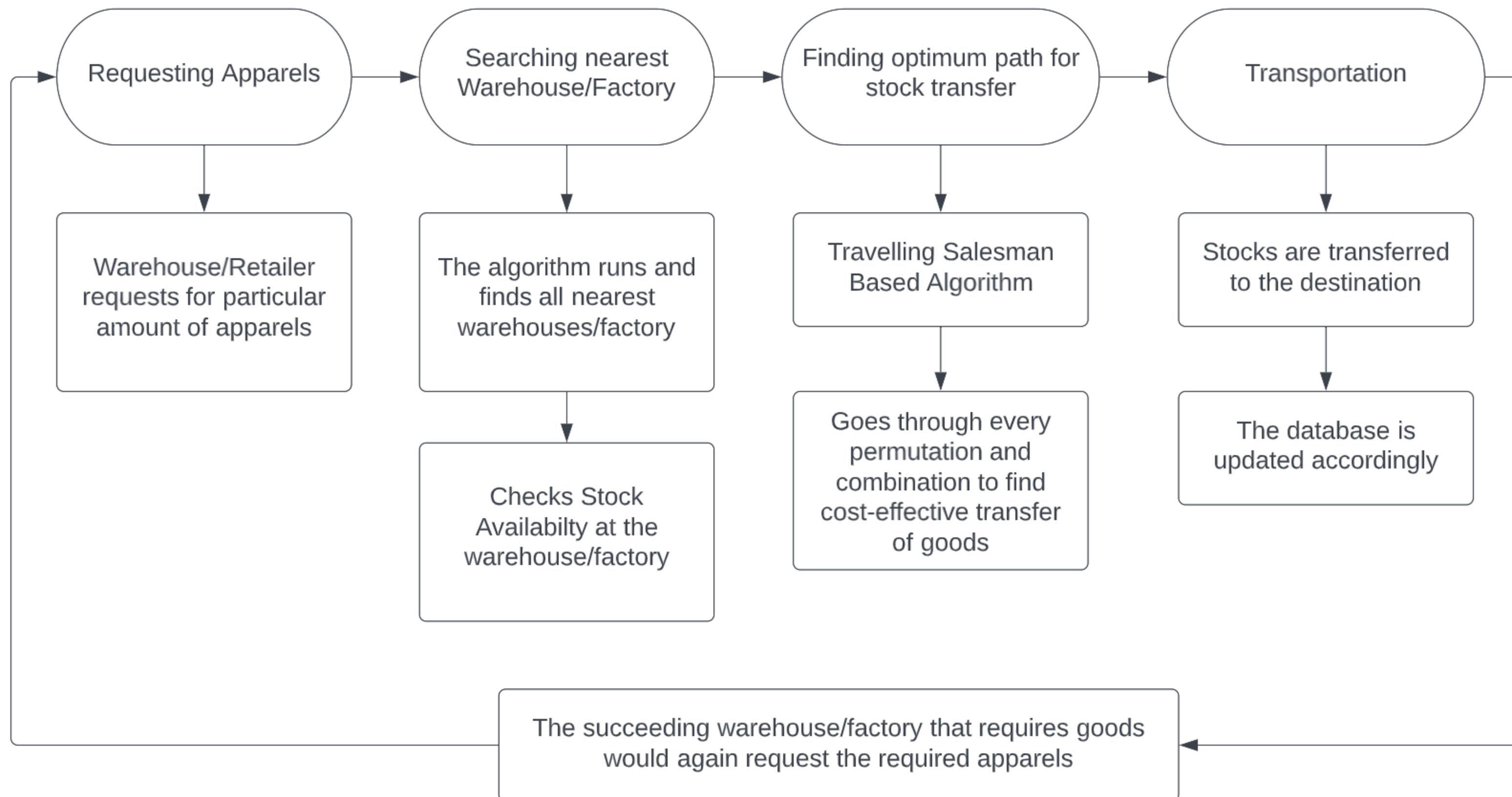
- ✓ Historical data would be collected from company database, and Google Calendar API along with Accuweather API to get current holidays and weather conditions.
- ✓ Using reinforcement learning would help to not only use public holidays and weather conditions as a factor for sales but also to predict under unforeseeable situations
- ✓ This would ensure optimum stock available at any time and no stocks would go waste or stay lying around in warehouses.

PROPOSED SOLUTION



- ✓ The GPS-tracking would provide live-tracking service to both source and destination along with the retailer for whom the goods are meant for.
- ✓ FIFO Algorithm would be implemented so that the items that arrived first would leave first thus no old stock would arrive at the retailer.
- ✓ Camera would be placed in such a way that three prediction algorithms can be implemented at the same time.
- ✓ Every warehouse would have scanners implanted at entrance and exit so that the QR code can be scanned.

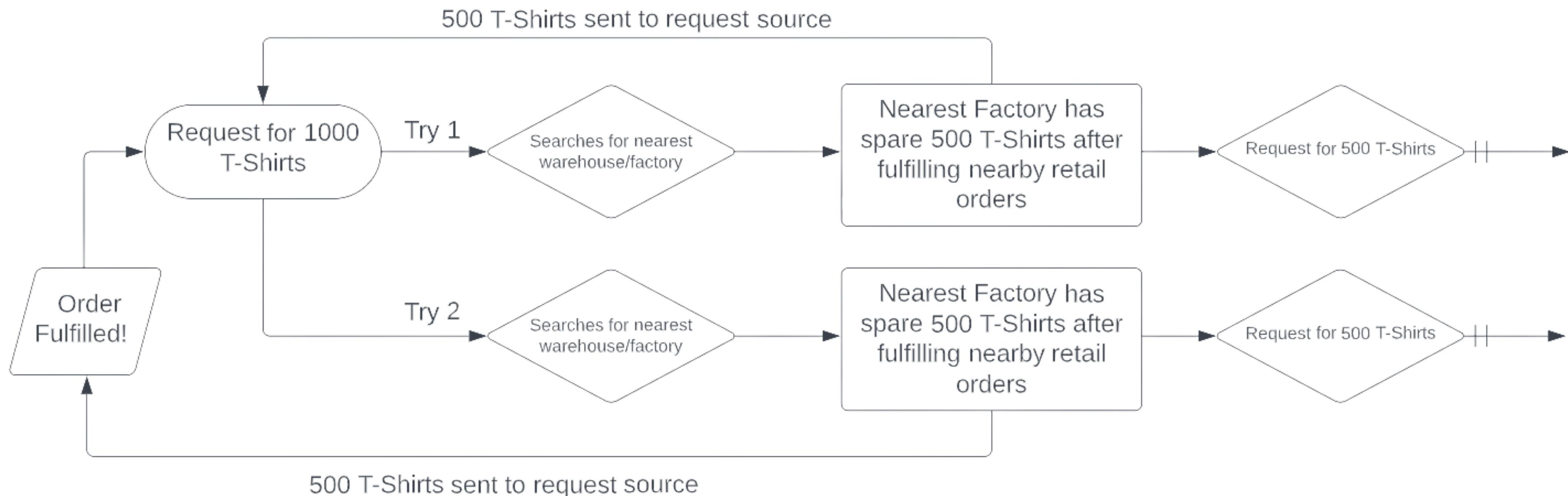
TRANSPORT OPTIMIZATION



EXAMPLE OF SHIPMENT

✓ While searching for nearest factory/warehouse, optimum cost-efficiency is checked for using algorithm similar to Travelling Salesman Problem

✓ Even if nearest warehouse has partial stocks, but a much further warehouse has full stock availability and the transportation cost is less than for nearest warehouse, then the second way would be preferred.



INNOVATION AT TRUCK-LEVEL



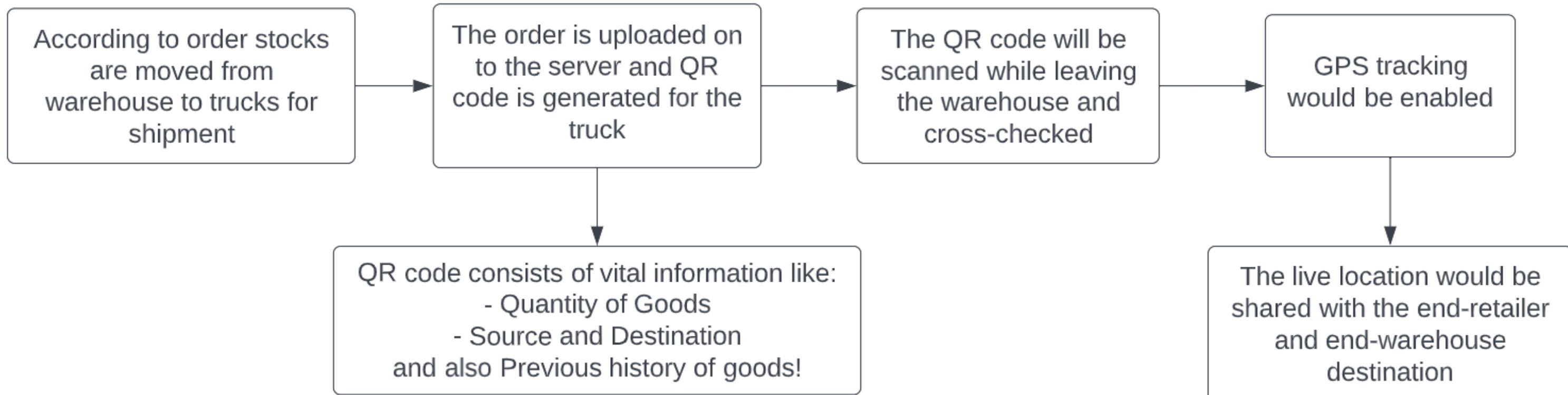
GPS-trackers can either be integrated navigation system with the vehicle or miniature trackers can be fixed to detect real-time movement



We have started working on QR-code generation software for trucks.



Using IoT applications, we are going paperless for transport transactions



QR-INVENTORY

```
1 import pyqrcode
2 import png
3 import hashlib
4 from pyqrcode import QRCode
5 from pyzbar.pyzbar import decode
6 from PIL import Image
7
8 def QR_gen(noTshirts, noJeans, noShirts, noPants, noShoes, Source, Destination):
9     QRs = str(noTshirts) + "@" + str(noJeans) + "@" + str(noShirts) + "@" + str(noPants) + "@" + str(noShoes) + "@" + Source + "@" + Destination
10    Enc_Qr = hashlib.sha256(QRs.encode())
11    Enc_Qr = str(Enc_Qr.hexdigest())
12    QR = pyqrcode.create(QRs)
13    QR.png(Enc_Qr+".png", scale = 6)
14
15 def qr_decode(img_path):
16     decocdeQR = decode(Image.open(img_path))
17     text = decocdeQR[0].data.decode('ascii')
18
19     data = text.split('@')
20     dataDict = {}
21
22     dataDict['noTshirt'] = data[0]
23     dataDict['noJeans'] = data[1]
24     dataDict['noPants'] = data[2]
25     dataDict['Shoes'] = data[3]
26     dataDict['Source'] = data[4]
27     dataDict['Desitnation'] = data[5]
28
29     return dataDict
30
31 #Generating QR Code
32 QR_gen(100,20,56,89,90,"Bhopal", "Ashta")
33
34 #Reading QR Code
35 res = qr_decode()
36 print(res)
```



SOLUTIONS

PREDICTION SYSTEM

Use of reinforcement learning would help to predict future requirement of items under unforeseeable circumstances using data from different sources.

TSP-LIKE ALGORITHM

Using TSP-like algorithm would ensure transportation of goods to destination in cost and time-efficient manner.

TRACKING TRUCKS

Using QR Codes to track goods inside the truck and GPS to track the truck, to get timely updates about transit.

WILL THE IDEA DELIVER BUSINESS VALUE?

Business Value Delivered Flawlessly

The audience that we are concentrating on are the companies that have widespread warehouses and factories around the country. The idea can be currently only implemented for domestic shipments. This would help in revolutionizing the entire supply chain.

The idea proposes to create a website that would be providing a user-friendly interface for interacting with the databases and placing orders, tracking packages. The website would be using Flask, SQL, and quite a few APIs to provide overall quality of a consumer's experience when interacting with these products.

FIFO approach would ensure that no stock stays halted at a particular location, the goods that are ordered first would be leaving the warehouse or factory first. The use of these approaches would help in maintaining cost-effective operations in the warehouse and factory.

IS THE IDEA UNIQUE?

Unique in its own Way

We would be using a TSP-like algorithm to optimize the transportation of goods ensuring cost-effectiveness and also optimum goods storage.

Generating QR-code for easy transit of trucks through warehouses, also encrypting data in the QR-code to prevent data leak. This would also reduce carbon-footprint of the company as our idea would help the process to go paperless.

Currently, FIFO is implemented in various warehouses but they are done manually, our algorithm would automate the whole process and thus optimize the costs of operation.

IS THE IDEA IMPLEMENTABLE?

We have designed a complete flowchart of the processes and these processes would be using either basic Computer Systems, IoT devices or other equipment that are already being used by the Supply Chains.

Our aim is to introduce the minimum amount of new products but substantially increase the productivity of the supply chain.

IS THE IDEA SCALABLE?

Scalable yet innovative

In order to make this Idea scalable, we have introduced a couple of features that are the least cost effective and at the same time it reduces the cost and possibility of loss during Hazardous situations.

Computer based Transport optimization along with QR based Tracking of shipment convoys which would eventually find the least cost transportation with optimum security and safety of stocks.

FIFO Algorithm is used for exporting the fresh products that arrive first. Which results in the constant movement of goods and avoids spoilage. Easier supply and demand planning as stakeholders know when they can expect to receive and process goods.

WHAT IS THE EXTENT OF IMPLEMENTATION DONE DURING MVP PHASE?

We have coded and implemented the qr code generator which would generate a QR code that would be present with the drivers who would be transporting the cargo to the required destinations. Paperless transactions would also be done using the same qr code

Traveling salesman based algorithm is also under development. The Algorithm is already mapped and put into the documentation and the coding implementation is remaining.

We're also currently working on a stocks prediction algorithm under the sales forecasting model for predicting the sales for upcoming months. This would ensure optimum stock availability at any time and no stocks would go waste or stay lying around in warehouses.

CONCLUSION

The idea would be automizing most of the manual task like, generating invoice for each transit, predicting stock requirement.



The idea has been implemented using various technologies and thus have various novelties.



Most of the ideas are easily scalable and can be implemented with adequate research and development



THANK YOU



VARS

LOGISTICS  SORCERER