



## **PITNEY BOWES SHIPPING HACKATHON 2019**

### **THEME 1**

#### **Seamless and Intelligent Shipping**

### **PROBLEM STATEMENT**

Providing businesses with an intelligent way to ship that is both cost-effective and efficient.

Use cases you can explore:

1. Intelligent Parcel shipping/Tracking/Receiving using AI/ML-based techniques e.g. Using Historical data to provide suggestions, Savings, visual recognition of parcel type and suggestive packing to reduce shipping cost and space.
2. Parcel Receiving Management: Use AI/ML to automate screening and receiving of parcel - the most secure way to do it.
3. Predictive Shipping Planner: use of Google API's, Carrier API's to predict the most efficient way to plan and send the shipments. Any integrations with retail or eCommerce orders for such a planner also falls in this area.
4. Parcel Security: Develop ML/AI based parcel scanning system to scan the shipment for dangerous goods being shipped.
5. Voice Supported Shipping: Build a conversational user interface for shipping tablet to enable shippers to pick, pack and ship orders with voice-enabled commands like Alexa, Google Assistant. It

may include, but not limited to, handling orders, printing labels, packing slips, purchasing postage, checking balances.

6. Parcel Insurance: Use Predictive analytics to suggest the parcel insurance amount based on Pitney Bowes datasets (Crime, Geography).

7. Reduce undelivered mails and packages by enhancing addressing capabilities.

8. Carrier choices based on cost, predictive delivery, the value on added services or fastest delivery.

## IDEA SUBMISSION

### OVERVIEW

This is an application specially designed for delivery boys that helps tracks their orders comfortably by providing them the shortest route available for delivery and connecting them directly with the admin of the company who assigns orders to them.

There will be a separate app for admins. This application gives a function which builds a link between Admin and the Delivery boy. Through this application, the admin can assign a delivery boy to order and track them.

This helps in rendering a better service of shipping as everything is monitored by the admin with the help of an application which works on your phone.

### BENEFICIARY/USER SEGMENT THIS SOLUTION IS INTENDED FOR:

We are building applications for over 750,000 businesses across the globe. The shipping company of the business must deliver goods across a city and not inter-city. The shipping business is considered local and goods are not transported by heavy vehicles like ships etc.

# SOLUTIONS

## AN APP FOR DELIVERY BOYS AND ADMIN

### FEATURES OF THE DELIVERY BOY APP:

- The app tells the perfect shortest route based on the traffic at that time and the local conditions and geographical weather of that area. This will help to reduce fuel consumption and maintenance costs
- The application prioritises the list accordingly and puts those deliveries at the top who have higher priority so that they reach first, no matter the distance.
- Smart Email Content Curation and feedback form which implements AI which is sent itself when the delivery boy is near to the delivery address and after he has successfully delivered the parcel. Through this even the customer can track the delivery boy activities by getting the mails.
- If a delivery boy is unable to deliver a product then the delivery boy can type the reason why the order was accepted but not delivered.
- Delivery boy can make set their status as Online/Offline through the application. This will make their presence or absence.
- Delivery boy can either confirm or decline the new order assigned to him.
- OTP must be entered by the delivery boy to verify that the delivery is conducted by him to the right customer.
- Delivery boy can choose the order and notify the customer that they are currently on their way to deliver the order.
- A parcel security-bar code scanner of each order will be sent to each person through email voluntarily by the delivery boy.
- Once the delivery boy has login the application, he/she is lead to the Dashboard page which has the details of Sales and Order. It is presented in the form of a priority table which have different cards of all the deliveries that have to happen today.
- The dashboard "Your tasks today" has the following info - unique ID number and address of each order.
- Here he can see various information related to the orders-

1. Pending Order- The order which is yet to be delivered are shown here as pending orders.
  2. Process Order- Those orders which are currently in process of being delivered is shown here in processing order.
  3. Completed Order- Those orders which happen to be completed that is they are delivered are shown here.
- Apart from orders, the delivery boy can view the location of the delivery boys. Those delivery boys who are free are demarcated in Red Sign and those delivery boys who are busy are demarcated with Green Sign.
  - A Google map integration feature is also provided which will arrange the order list priority wise based on traffic,distance etc. He can also decide the priority himself by rearranging the deliveries himself according to it.
  - He can send the QR code to receiver anytime throughout the delivery voluntarily or if he forgets to send it, the QR code is sent automatically when he is near the delivery's address.
  - A feedback form is sent to the customer automatically when the QR code gets scanned by the delivery boy and the delivery is confirmed. The feedback form shows no of stars, the net average of which will be shown in the delivery boy's profile.
  - The delivery boy can request extra deliveries once all of them gets completed.
  - A Chatbot with voice recognition to chat with the admin on the go.
  - The delivery boy can check the number of orders. Which are the closer ones, how many orders are delivered and how many of them are actually pending
  - The delivery boy can accept the delivery order or he can also reject the same if the location is not appropriate or he is done with the day or in case of any emergency.
  - The delivery boy can check his own history, how many orders he has delivered in a day or track it for a week or even for the month or even the total numbers of orders till date.
  - The driver must be given the details of the contact number of the customer. Just one click and the driver can make the call and ask about the location or any other detail.
  - Once the order is delivered, the customer has to put his signature on the confirmation on the e-sign page and get the QR code which he got mailed scanned by the delivery boy.
  - The delivery boy can receive the payment of the order through various modes like cash, debit or credit card or even through the wallet.

- The delivery boy app must support various languages to ease the delivery boy in delivering the order in their local language.

## Smart Routing

- Smart routing for route the courier boy for optimize path to pick or deliver shipmen.

## A SEPARATE ADMIN APP- THE LINK BETWEEN DELIVERY BOY AND ADMIN

### ADMIN FRONT

**A separate app for the company which feeds no and address of orders to each delivery boy. It also gives the orders with highest priority. Tracking of each delivery, adding deliveries, contact of each delivery boy and a chat bot.**

- The application provides an admin panel which facilitates to manage orders and delivery boy. The admin can view the orders and assign the new orders to a delivery boy.
- The admin can even receive notifications in the application.
- The admin can click on Delivery Boy, to view the list for the names of the delivery boy along with the assigned Orders.
- The Admin can even add new Delivery Boy to the application and Search the existing Delivery Boy. A new delivery boy can be added by the admin.
- The admin can enter following details here which is related to the Delivery Boy-
  1. Delivery Boy Name- The name of the delivery boy can be added here.
  2. Email Id- The e-mailing address of delivery boy.
  3. Mobile Number- The phone number for the delivery boy.
  4. Vehicle Type- The vehicle which delivery boy is using for delivery like- a bicycle or bike
  5. Vehicle number- The register number of the vehicle which delivery boy is using for delivery.

- The admin can even view the registered Delivery Boy details.

## Delivery Boy Order List

- The admin can also see the list of the orders assigned to the delivery boy. From the navigation panel, the admin can navigate to the Delivery Boy.
- Here, the admin will see the list of all the sellers and by clicking on the name of the seller, the admin can also see the list of the assigned orders to the delivery boy.
- Delivery boy and the admin can see the comment history of a specific order.
- The admin and delivery boy both can receive notifications with regard to Order.
- Admin can add a delivery boy to the application.
- The admin can see the list of the delivery boys.
- Admin can track the status of delivery boy and assign them an order.
- The admin can chat with the delivery boy to ask them questions and answer their queries

## IMPORTANT FEATURES THAT ARE TO BE INCLUDED IN THE APPS

### 1. CHAT-BOTS

Interestingly, Chatbots have access to lots of customer-centered data points—they can also combine location-specific requests to easily detect repetitive problems, identify patterns, and predict what's causing problems for a certain user. Most times, this makes them more intelligent and knowledgeable than human customer service representatives. Artificial intelligence (AI) has affected every aspect of the business (e.g., prospecting, marketing, sales)—especially in the area of customer service. If you want to stay ahead of the competition, you must begin now to develop plans on how you can leverage AI to significantly improve your own customer service operation.

### **Chat with Delivery Boy-**

- A chat with delivery boy keeps Admin updated on the current status of the order and tracking of the delivery boy can be conducted in a better way.

## **2. GOOGLE MAP INTEGRATION**

### **Why did we integrated google maps in our app?**

- Integrating Google Maps in our app which will provide information like street view, shortest path and distance for delivery of items, prioritising orders and showing them on map, most convenient path available in the shortest time etc.
- Google maps also show the weather conditions of that area during that time.

### **Google Geo Location**

- See your drivers or delivery boys live on google map. You can also check back dates travel history.
- This is one of the must-have features in the delivery boy application development. The driver can get the location of the customer through GPS and reach there without faffing around.

# STRUCTURE OF THE APP

## 1. DELIVERY BOY'S PROFILE AND RECORD

- The delivery boy's profile will contain 2 segments i.e. user profile and record. The user profile just shows all the information he entered during sign in. The record shows his/her past deliveries, bar graph showing no of details done per day, no of total stars given on the basis of feedback etc.

## 2. ADMIN'S PROFILE

- Here admin can see the details entered on the registration form, apart from that admin can see the 'Status' of the delivery boy which gives the idea that he is in the Active/inactive state, that is if he is Present or Absent.
- After this, the admin can even view the orders assigned to the delivery boy. In this section, admin can view-
  1. All- List of all the orders assigned to the delivery boy.
  2. Delivered- All the orders which have been delivered by the delivery boy.
  3. Undelivered- List of all the orders which are yet to be delivered by the delivery boy.

## 3. NOTIFICATIONS AND NAVIGATION DRAWER

The admin can receive notifications as Alerts and Message, which can be viewed by admin by pressing the Bell Icon on top of the Dashboard Page.

Push notification should hit the customers device when the order is placed or is out for delivery, or about the expected date of delivery or when the order is finally delivered.



## 4. NAVIGATION DRAWER

The application has a navigation drawer on the left side, this facilitates the admin with various functionalities-

- Dashboard
- Orders
- Delivery Boy
- Chat
- Logout

## 5. ALERT FOR THE ADMIN APP

The alert section shows the Orders along with the latest status. From here the admin keeps notified about all the orders and act accordingly.

## 6. POD (Proof of delivery) OR E-SIGN PAGE

- Last Proof Image And Sign.
- QR code scanned by the delivery boy.

## SIGN-IN FOR DELIVERY BOYS

Log in/ register page
Employee ID card scanner which scans bar code and fills all details automatically.
Phone number verification
Every delivery boy is assigned an unique ID.
The delivery boy's account is linked to his/her Google profile.

## SIGN-IN FOR ADMIN

The admin can easily log into the application by adding the login credentials.
Email ID- The admin can easily login to the application by entering the registered email id.
Password- The admin can enter the Password for the application here to login to the application.

## **Solution decision point (Reason behind choosing a technology)**

### **Why did we integrated AI in our app?**

Global cyber threats alongside sustained pressures over environmental regulations have always been a challenge for the shipping industry which made digitisation an indispensable alternative for the maritime industry. All over the world, major shipping industries have been keen on improvising systems to nurture and innovation and find solutions to these concerns.

When it comes global shipping, AI has emerged as one of the prime technologies that have practical use cases which organisations are adapting in their organisational work routine. However, while most of these technology implementations are in the conceptual stage, to achieve business value and traction out of it will take the due course of time.

AI and automation play a significant role in the shipping industry and businesses are having great success with AI blending well with machine-human interaction and logistics collaboration. In this article, we list down how these technologies are transforming the shipping industry at large.

### **How's AI and Automation Changing the Shipping Industry?**

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- The retail shipping channels are taking advantage of AI and logistics and can offer faster delivery as a competitive option as it has enabled cost cuts that allow for expedited delivery. This is further accelerated as retailers are using similar technology to get products sent by sea from their factories to their continental distribution centres

- AI is helping to make much more accurate predictions on estimated times on arrival for deliveries as well as spotting trends and risks in shipping.
- Machine learning capabilities are also helping in the analysis of historical shipping data by considering factors like weather patterns and busy or slow shipping seasons by which the final analysis is refined existing processes like inefficiencies, errors, and duplications.
- And automating processes could identify signs of a coming problem or conflict before it has fully unfolded, then make the needed adjustments in order to prevent an issue in advance.
- The use of AI is also allowing to provide valuable insights from the realms of data that are a natural by-product in the shipping industry.
- Using analytics is also helps to better understand customer's challenges which enable business processes to transform that data to anticipate future needs and expand the value to customers.
- AI technologies are also being used to mimic human perception and cognitive abilities such as seeing, hearing, reading and interpreting sensor data which are benefiting user interfaces such as speech recognition directly helps in controlling and managing deliveries.

# **The impact that the solution would create; the impact metrics that one can use to analyze the effect of the solution**

Most common issues faced by businesses are :

- Currently , customers are unable to track their order & know it's exact location.
- When an order is placed, it is assigned manually & handed over in the form of paper slips to the delivery boy
- If the order gets delayed, the customers tend to get impatient & call up the restaurant/shop
- Neither the restaurant or the customers know the location of the delivery
- No way to make sure if order was successfully delivered
- Companies unable to keep track of time wasted by field staff
- Inefficiency in providing service at the right time.
- Delays in service provision
- False claims made by service employee regarding assigned jobs ( blames traffic, weather, unavailability of client at the other end)
- Excessive reimbursement claims by employees based on fake expense data

Let's evaluate the effects :

1. Longer route results in higher reimbursement costs
2. The customer is unhappy, gives a negative rating & may not order again
3. The delivery boy is unhappy
4. There is a negative impact on the work environment

Now, this gets multiplied by the number of delivery boys & the number of failed / delayed deliveries.

# HOW DO OUR APPS SOLVES THESE ISSUES AND HELP THE DELIVERY BOYS?

Effectiveness of the solution in solving the problem defined and ease of implementation.

## →Order management

Managing orders is a stressful task for it involves – checking received order, conveying orders , assigning delivery, check if the parcel has been delivered, and so on. The app will be designed keeping in mind all these tasks. Now, managing all these order related activities will become a task of few clicks. In effect, this would save shipping companies a lot of time, which they can spend in enhancing their services, promoting their business, and so on.

## →GPS Tracking

With the Android app, tracking the exact location of an in progress order would be much easier. The app is integrated with the GPS technology, which is much needed whenever a delivery service is included. The app also triggers notifications for key milestones, such as order is out on delivery, and orders is delivered and marked so by the delivery boy.

## →Assign Deliveries On-The-Go

It is not possible that the admin remains available in the shipping company at all times. With this app, owners can manage their orders anytime & from anywhere.

Initiating a delivery is just a matter of two clicks – first, change the delivery status to in-progress & then select the delivery staff, which they find right for the task.

## →Intuitive UI/UX for easy management

The UX of the app will be designed to reduce the time and efforts that shipping company owners puts in to deliver a particular parcel. With the app, they can manage the orders, assign orders, change the status, check the location of delivery boys, etc. in just a few clicks. The app has easy navigation which allows delivery boys to switch between tasks easily.

## →Check orders

Delivery boys are needed to be updated about the orders in the real-time as to when & where the order is to be delivered. They also need to keep the admin in the loop for delivered or canceled orders. Managing all these tasks on the go can be a hassle, which often results in delayed & mixed up delivery. With the app, checking orders pending for delivery, orders delivered on a particular day, etc. will become super easy. The app also allows the delivery boy to search orders by the order number.

## →Change status

Maintaining a continuous communication channel with the admin is essential for delivery boys. To save the trouble, our app allows delivery boys to easily change

the status of their order. There are four statuses – pending, in-progress, delivered, and cancelled, which delivery boys can manually select to intimate admin about the order status.

## →Check Previously Delivered Orders Log

Keeping track of the number of parcels delivered by a particular delivery boy is essential, which is why the app shows the list of items delivered previously. Delivery boys can easily filter those orders according to the timeline they prefer. The app allows delivery boys to check current month's, current week's, today's, or all orders.

## →Call the customer with one click

A direct communication between the delivery boy and the customer is also important. Understanding the importance of this feature, our delivery boy app provides contact information of the customer along with the order details. With one click the delivery boy can contact the customer. It will be integrated with click to call links for the ease of the delivery boy while delivering the food order.

## →Cash on Delivery

In case of cash on delivery, our app allows the shipping company owners to specify whether the product has been paid for or not, so it appears with order in



the delivery boy app. This in turn, automatically eliminates the need for repeated communication between the admin & delivery boy.

## Conclusion

- There is no denying the fact that the growth in the online order ordering & delivery industry is huge & will continue to stay so. In fact, it is expected that online parcel ordering sector will produce many unicorns in coming years.

## ASSUMPTIONS AND CONSTRAINTS

- The orders will be delivered across a city and not inter-city.
- The shipping business is considered local and goods are not transported by heavy vehicles like ships etc.
- The delivery boy needs to maintain constant contact with the admin app in case of any confusion.
- The orders are to be delivered in a priority with those orders delivered first who have paid extra money for fast delivery no matter what the distance.
- The delivery time won't be exact and can depend on the weather and traffic conditions of that particular time.

## TIME TO MAKE A PROTOTYPE

It will take about a week to make a prototype for our proposed idea. It will take about a month to make a fully functional app for the idea.

## FRAMEWORKS/TECHNOLOGIES AND APIs' TO BE USED IN THE APP

- Google direction API
- Places API
- Polyline which is included in Google map
- Firebase for database
- Tensor traffic for traffic detection
- Machine learning
- Android Studio
- **Google Maps and Google Location Services API** for Android
- **OpenStreetMap API** for both iOS/Android
- Pitney Bowes location intelligence API for location information
- Location intelligence SDK

*BY TEAM- raj1200\_fc8c*

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