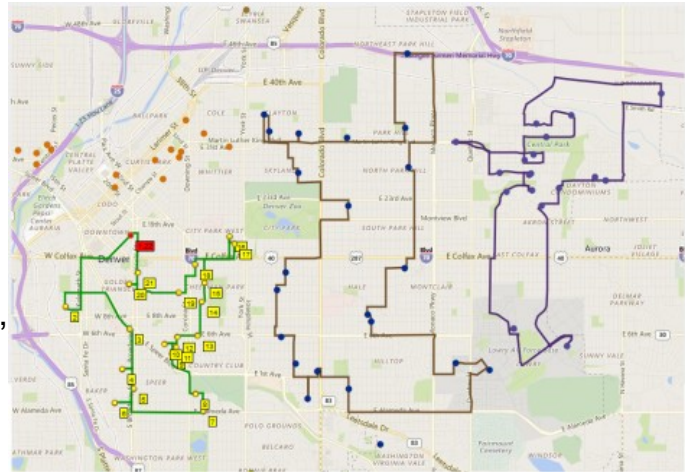


BUSINESS REQUIREMENT DOCUMENT

“The **purpose** of this project on *Route-Optimisation* is to develop algorithms to design route on daily demand basis and dynamic allocation through Live-Route Optimisation so that we can help clients setting up their supply chain network and to implement this feature in our retail and e-commerce business of Instacare/Pharmacy.”

What Is Route Planning Software?

Route planning software is a practical, handy technology tool that allows those planning their own routes or in charge of planning the fleet's routes each day to automatically generate the most efficient routes for each vehicle in their fleet, based on the day's service calls, deliveries, or pick-ups.



OVERALL BENEFITS OF ROUTE OPTIMISATION

1. Immediate Return Of Investment (ROI)
2. Reduced Fuel Costs
3. Reduced Labor Costs
4. More Productivity
5. Less Carbon Emission
6. Customer Experience
7. Increased Transparency, Efficiency and Consistency in Operations

FEW APPLICATIONS

1. A package delivery company wants to assign routes for drivers to make deliveries.
2. A ride-sharing company wants to assign routes for drivers to pick up and drop off passengers.
3. A cable TV company wants to assign routes for technicians to make residential service calls.

PICKUP AND DELIVERY BUSINESS CATEGORIES:

Depending on who is sending a service request and who is the provider, the pickup and delivery business can be categorized into the following three categories:

1. *Person To Person Pickup and Delivery - P2P*

Eg: Conventional Courier Service

2. *Business To Person Pickup and Delivery – B2C*

Eg: Ordering a pizza from Dominos

3. *Business To Business Pickup and Delivery – B2B*

Eg: When both the supplier as well as the buyer are companies

PICKUP AND DELIVERY BUSINESS MODEL

The sole purpose of a pickup and delivery business is to pick an item from point A and deliver it to point B. The sender books a delivery agent according to location and availability. The concerned delivery agent picks up the item and delivers it to the mentioned destination.

IDENTIFYING INPUTS AND OUTPUTS

Input Details:

- ✓ Location
 - ◆ location coordinates (lat_long)
 - ◆ Number of locations
 - ◆ Start location vector (contains start point for each vehicle)
 - ◆ End location vector (contains end point for each vehicle)
- ✓ Vehicle
 - ◆ Number of vehicles
 - ◆ Capacity Vector (contains loading capacity of each vehicle)
 - ◆ Upper bound for distance/time
- ✓ Constraint Specific Inputs
 - ◆ Demand for each location (en-route pickups or deliveries)
 - ◆ Time window of each location
 - ◆ Location Priorities (if any)
 - ◆ Inter-customer transportation request (Shipment)
- ✓ Other Constraint dependent inputs
 - ◆ Loading and Unloading Constraint
 - Vehicle load time
 - Vehicle unload time
 - Depot capacity for load/unload
 - ◆ Open Routes (Return to depot not required)
 - ◆ Multiple Capacity dimensions/compartments

Output Details:

- ◆ Display of optimal route for the fleet of vehicles (not just the most optimal route but *the most optimal operationally executable route* that matters)
- ◆ Display Information includes route, instant load, time window for services, etc.

- ◆ Route Map Details
 - *Name, Contact, Vehicle No.,(Driver Information)*
 - *Time Window (Departure Time/Reaching Time/Waiting time)*
 - *Loading Details as per the locations*
 - *Addresses Type(Pickup or Delivery)*
 - *And Other details*

FUNCTIONAL REQUIREMENTS

Customer Side:

- Place an order
- Schedule or Preferred time-window
- Track a delivery
- Make Payments
- Able to contact the delivery agent
- Feedback

Agent Side:

- Pickup point
- Delivery Point
- Potential Route Details
- Generate Invoice
- Accept or Reject a delivery request¹

Admin Dashboard:

It must intimate the admin about

- Any and all upcoming orders
- Corresponding delivery agents
- Real-time tracking
- A feature to send notifications to customer and delivery agents
- Analytics and report management

Application Features

Features	Details
Determine Cost-Efficient Route	Minimize delivery cost & save a huge amount of time by utilizing an automated route optimization feature.
Set Optimization Goal	Minimize Distance/Minimize Time/etc.
Integrated GPS Tracking	Provides turn-by-turn directions for as many stops to as our delivery drivers need to make across any geographical area
Integrated Map Data	Import addresses from Excel, Text, or CSV file Column Format: <i>Addresses(lat-long coordinates/Service-Time/Pick-up/Drop-off/etc.</i>
Dynamic Route Planning ²	Software should have the capability of optimally handling

¹ Rejection must be followed up with a reason

	on-demand orders along with scheduled orders; also, in the event of a vehicle breakdown.
Real-Time Traffic Consideration	It can not only save our logistic costs but can also ensure on-time delivery and better adherence to SLAs ³ for increasing customer delight.
Track Delivery Agents Anywhere	Monitor and manage your delivery agents in different areas with the unique geofencing feature.
Export To Excel	Export routes to Excel and save them to your local device.
Print	Some drivers may prefer a print-out of their routes.
Pin The Route	Pin the Route Map for Driver
Save Routes Online	Save the planned route online for future use
Reload Saved Routes	Reload and update saved routes
Share(email/other sharing platform)	Route can be sent to Driver/Customer/Owner so that they can print/save it from there.
Enable OTP for E-POD ⁴	OTP verification can be used as Proof of Delivery instead of digital signature to provide contactless deliveries.
Robust Chat Support System	Integrated live-chat support system software to help customers get fuss-free customer assistance without human contact
Analytics and Report management	Ability to track and manage entire operations in real-time on a single platform. It tracks the actual routes vs the planned routes and should help compare the performances of different business hubs.
Advance Business Analytics	It assists you in recognizing the customer behaviour & lets you target them with products that offer more value. Eg: Historical Data Inspection

PAYMENT OPTIONS

Solution 1:

- Routing Services can be offered for free trial for a limited period of time (5-7 days)
- A subscription charge can be imposed for the further use of services offering ranges in multiple durations. (1 month/3 month/ Yearly)

Solution 2:

- Pricing can be done according to the different plans offered such as Basic/Pro/Advanced.

² In case the orders/preferences of the customers change while the rider is out to deliver, Route Optimization software should be able to change and create new routes for the rider.

³ A **service-level agreement (SLA)** is a contract between a service provider and its customers that documents what services the provider will furnish and defines the service standards the provider is obligated to meet.

⁴ Electronic Proof Of Delivery

- The different plans will have differences based on the features, number of fleets, etc.

RECOMMENDATIONS OVER COVID-EFFECTS⁵

With the pandemic causing a lockdown, our reliance on doorstep delivery has surged and naturally, companies that are delivering essential items are now facing a major stress on their supply chain.

There are few suggested recommendations to provide contactless deliveries:

1. *Accommodate drop-at-doorstep or apartment gate requests*

This can be done when the customer is at the checkout page on your app. The customer can choose the type of delivery they'd prefer. It can be doorstep delivery, apartment gate delivery, contactless delivery, etc. Would be a good idea to also provide an option to leave customized delivery requests/notes. This will ensure that both the driver and the customer can respect social distancing.

2. *Enable prior ETA alerts*

While checking out, the customer can also choose to get ETA alerts, say 30 minutes before package arrival or 15 minutes before package arrival and so on. This will ensure that the customer is prepared to collect the parcel, in case they want to collect it from their apartment gate. This can be an add-on to the already existing tracking link.

3. *Avoid digital signature (E-POD), instead, enable OTP*

These days, the proof of delivery is usually a digital signature on the delivery person's mobile or tablet. Please avoid this as it could potentially transmit the virus. Instead, enable One-time password (OTP). One-time password (OTP) verification at the time of delivery adds an additional layer of security to your packages. Once the OTP is matched, you can go about sending the invoice. This also helps in social distancing.

⁵ Source: COVID-19: Technology Help Guide for Logistics Businesses, LOCUS (2020)
https://drive.google.com/file/d/1uYpbFQXSWwW8OiNHmlbDN_y2OPoLRocB/view

