Doordash Robonav

Navigation tool for Doordash Robots

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Background

Why Are We Here?

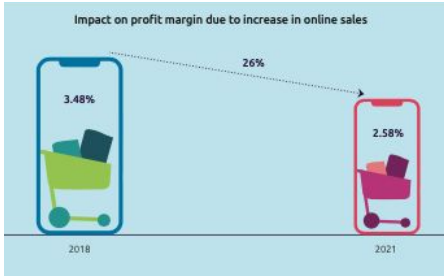
- Last mile delivery is a huge cost for us today[6]
- Large number of customers order from nearby restaurants for faster delivery
- Most of our dashers are engaged in Last Mile Delivery operations than taking large complex orders

Business Case

Initial Focus

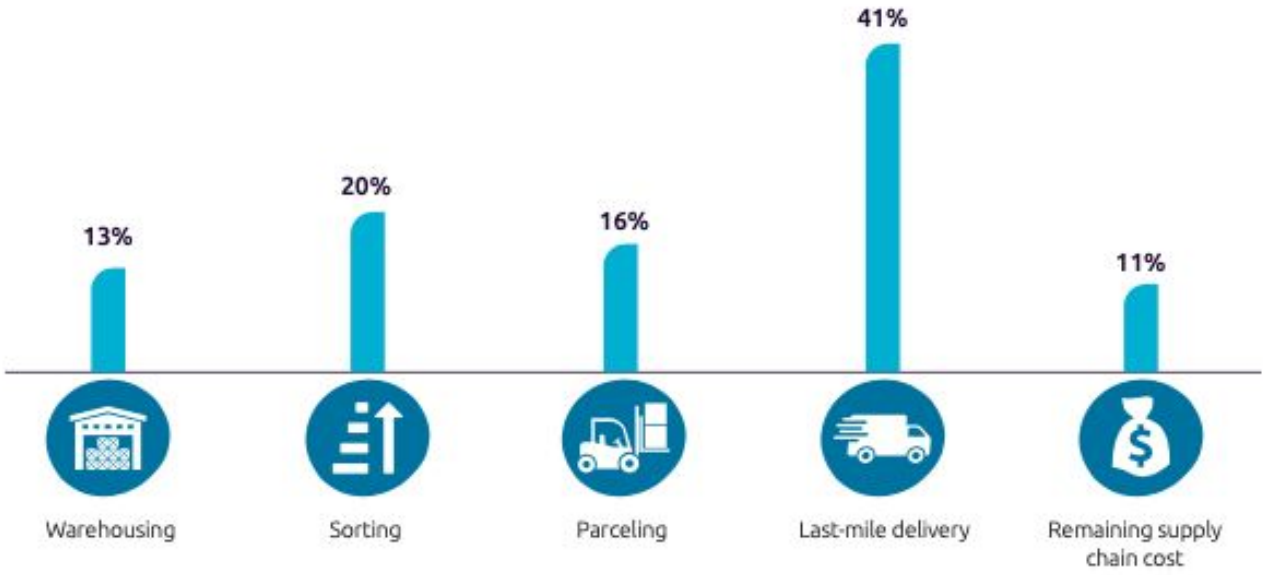
Where are we starting?

- Last mile delivery constitute 40% of distribution costs[6]
- Net profit reduced by 26% because of last mile delivery logistics[6]
- Dashers do not earn much from these orders yet have to work harder
- Customers are asking for faster deliveries[6]
- Satisfied customers are willing to pay more[6]
- 55% of users may switch to a competitor for a faster service[6]
- Addressing this issue can significantly improve our productivity, efficiency and increase our margins



Absorbing a part of the last-mile delivery cost can potentially hurt retailers' profitability by 26%

Last mile delivery costs across industries



Source: Capgemini Research Institute, Last-mile delivery executive survey, October–November 2018, N=500 executives.

Opportunity

What's the problem?

- Last mile deliveries cost us $10 on average per delivery[6]
- We subsidise the cost to consumers and charge only between $2-6[3]
- Dashers have to work harder to make more deliveries while gaining fewer commissions
- Doordash's market share is the highest however the revenue is the lowest among the top three[5]
- Consumers demand faster delivery[6]
- Satisfied consumers are willing to pay 14% more[6]

Opportunity

TAM

- ARPU = 200$ approx[4]
- takeout price for 1 person 15$ approx[3]
- Household size in US = 2.52
- Hence takeout price = 15*2.52 = 37.8
- delivery plus service = 10$ approx[3]
- Commission from restaurants = 20% * 37.8 = $7.56
- 200/17.56= 11-12 number of orders per year per customer
- 60 million people order food from platforms[4]
- 1/3rd is doordash cust 20 mill
- Assuming all of them live in urban areas and 1/5th of them order from neighbouring restaurants: 20/4 = 5 million
- For 5 million users We can make additional 10-4 + 4-2 = $8 per order
- That is 5*12*8 = **$480 mill in additional revenue**

Proposal

What's Our Solution?

- An automated delivery system using self-driving robots to deliver food
- Replace existing last mile delivery operations with the new automated system
- Robots will be small, safe and secure enough to drive on the side walks
- Robots equipped with cameras and LIDAR sensors will be self-driven using computer vision and machine learning
- Delivery order generated will be assigned to a robot. The robot will travel to the restaurant where an employee places the order into the robot and it then travels to the customers location before it moves to another restaurant to pick up the order
- This will ultimately reduce the cost of last mile delivery and generate and additional revenue of $8 per delivery

Return On Investment

What can we do?

- Currently last mile costs the company $10 on average[6]
- Consumers are charged $2-6 approx $4[3]
- Automation robot vendors charge $2 per delivery
- Total revenue gained compared to previous = (4-2) + (10-4) = $8 per delivery
- Lets calculate for one neighbourhood of 2km radius the return and investment
- 20k house holds - 60 robots[2]
- Robots cost as much as a high end laptop i.e. around $2k = $120k for buying the robots[2]
- Average number of people in a household in US = 2.52
- Assume 1/3rd of the people are Food delivery users
- From TAM calculations we know that one person orders 11 times in a year
- With each delivery doordash earns 17.56$ from delivery charges as well as commission.
- Total deliveries in a year = 20k x 2.52/3 = 50/3. 50*11/3 = 550k deliveries
- Total revenue = 550k *17.56/3 = $3,219,000
- Fee charged by vendor = 550*2/3=366,666
- Total cost = 366,666+120,000 = 486,666
- **ROI = (3219000-486666)/486666=561.43%**

ROI = (3,219,000 - 486,666)/486,666

ROI = 561.43%

Measurement

How will we know if we're successful?

- Increase
  - Percentage of autonomous driving on average
  - Percentage of area mapped in the neighbourhood
  - Number of robots handled by a human operator
  - Number of deliveries fulfilled compared to previous historical figure in the neighbourhood
- Reduce
  - Number of human interventions required
  - Avg time to deliver on the same route over time
  - Number of accidents

Competitors

Postmates

Postmates Serve

- Revenue of more than 1 Billion USD
- Market share of 10%
- Currently in pillot stage
- Build their own robot
- Travels much longer than competing vendor robots
- More capacity than competing vendor robots
- Friendly and socially aware to pedestrians

Ubereats

Drone delivery

- Currently has a market share of 20%
- Adjusted Net revenue of 1.3 Billion USD
- Can potentially expand faster into automated delivery because of wide user base of other business verticals such as Uber
- Drone delivery can be faster than robots on the ground
- Currently only in a pilot program stage
- Can face more regulatory hurdles and safety concerns with drone delivery

Our Advantages

Why are we better?

- Less obtrusive to pedestrians
- Smaller in size hence more number of robots can be accommodated on the streets
- More security features
- Frees up dashers to accommodate more larger and complex orders with dashdrive
- Lower profile can make it go unnoticed by pedestrians
- Two way communication system to interact with people around to resolve issues

Roadmap and Vision

Roadmap Pillars

Where do we go from here?

- Our vision is to “Create a fully automated delivery service to give our customers a quick and seamless delivery experience”
- Roadmap Themes:
  - Launch a Pilot program in select locations
  - Move from a semi-automated to a near fully-automated delivery systems
  - Geographical expansion to other cities

Launch a Pilot program in select locations

The big prep

- Select an automation provider considering the following factors
  - Size and weight
  - Battery life
  - Charging time
  - Security
  - Self driving capability
  - Remote tracking and control systems
  - Price
- Narrow down locations to launch pilot program based on:
  - Simplicity of terrain
  - Location weather
  - Existing established Doordash operations
  - Good number of restaurants around the households
- Install and setup the automation system
  - Setup Robot hub for charging
  - Integrate the delivery system into the vendors robot management system
  - Hire human controllers to remotely follow, monitor control the robots
- Train the robots' machine learning algorithm around the neighbourhood to map the locality
- Provide instructions to partner restaurants and enable Robot delivery to select customers
- Use feedback to strengthen delivery system

Semi-automation to near Automation

Training wheels come off

- Train the Robots' Neural networks and machine learning algorithm to navigate the terrain and map the neighbourhood
- Increase the % of area mapped
- Increase number of robots monitored per human controller
- Increase average time to delivery over the same route
- Reduce number of human interventions required

Geographical Expansion

Scale

- Once the model is operating with a reasonable amount of autonomy replicate the model to other cities similar in size and scope
- Install and setup the robots in suitable localities
- Train the robots to map the terrain and neighbourhood
- Expand from the locations to neighbouring localities

Where do we go from here?

Widening the scope

- Expand the automated last mile delivery to other businesses looking to deliver products/goods
- Improve robots to be able to climb more difficult terrain and places such staircases, steep hillsides and interact with analog interfaces such as doorbells or elevator buttons.
- In the long term look towards launching automation of long distance deliveries with self driving trucks with smaller door delivery robots loaded onto it.

References

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Thank you!