Doordash self-driving robots

Monitor-Control Platform

Product Owner: Babak Ziaei

Background

Why Are We Here?

- A platform to monitor and control self-driving robots for an efficient and cost effective food delivery.

Robot Control App

Business Case

Initial Focus

Where are we starting?

Automation of delivery businesses is considered as the future of food industry. A platform to communicate with and control these robots efficiently are highly demanded. DoorDash as the leader of food industry tends to lower the costs of delivery by applying robots. This prject is a wonderful opportunity to gain that goal.

Opportunity

What's the problem?

- Delivery robots are intelligent agents, but they cannot be completely independent. Ususally, a platform, a software or else, connects the robot with an operator. Operator helps robots when they do face challenges. However, the available controlling platforms work only with specific robots, they are highly complicated, and restrict users to control few robots simultaneously. Moreover, relying on third party platforms will bound us heavily on the choices of robots and machinary, implementing necessary updates, and data protection. As the robot delivery is the future focus of DoorDash, obtaining a sofisticated and user friendly software is absolutely necessary. We also hope that owning a platform will reduce the risk of disregarding traffic saftey regulations by third parties. By developing such platform, we have more freedom to implement and update necessary AI and equipments. Using a third party's complete solution is very expensive. The expenses are due to the necessarty technology at our scale, constant communication with third parties experts, and data manipulation.

Opportunity

What's the problem?

- Since autonomous delivery is inevitable in future, autonomus systems will capture a huge market by 2027, https://roboticsandautomationnews.com/?s=aethon
- "Global 'Robot-as-a-Service' market set to reach $41.3 billion by 2028"
- All in all, autonomus systems are the future of transportation. Developing a controlling platform makes DoorDash independent and pioneer in the rising market. Robot delivery is seen as the revolution of food industry (1), and therefore, a platform to make it happen is fundamental.
- 1- https://www.wired.co.uk/article/anita-heinla-starship-wired-retail-2015
- But, having a robot does not mean we are independent in industry: "For all their cool physical manifestations, mobile robots are about 90% software," says Karen Leavitt, chief marketing officer for Locus Robotics,
- https://www.logisticsmgmt.com/article/mobile_robotics_descend_on_warehouse_operations

Proposal

What's Our Solution?

- A software to monitor the status of all robots, analyse and recognize the best and safe path, and manual intervention by human when necessary.

Return On Investment

What can we do?

- Software development will cost 100,000 euros + 10% annual maintenance.
- This will save us on buying UX desgin, AI solution, data storage, and manipulation, costs for updates or unpredicted problems. We can buy and order robots that have specifications particular to our systems. This also save us huge capital. The estimated cost for renting above tecknology will be 65000 to 70000 euros a year. Autonomous mobile robots (AMR) solution is about 20000e/robot, and we save 20% capital of each robot by purchasing robot compatible specifically for our system. Therefore, we should be able to earn the initial investment of 110000e easily in the first year. Consider that this system solution is for 150 robots, and they work only for 5 years. Then we need to replace every thing (robots and technology). Then ROI is,
- ROI = ((5yr*70000)+20%*20000*150-(150000))/((150000))=5,33 = 533%.

Measurement

How will we know if we're successful?

- 1- First usable software be made in one calender year.
- 2- Robots be purchased in next six months after software development.
- 3- Software development costs less than 100000e.

Competitors

Authon

ST Engineering Aethon, Inc.

- They build robots and robot control platforms for a wide variety of industries. They operate in the US and Asia. Aethon autonomous mobile robot makes over 5 million deliveries annually in customer facilities around the globe.

Lucas

- Optimizing wharehouses, transport and other modules; experts in AI solutions.

Our Advantages

Why are we better?

- We can design a system that specifically work for us. Our competitors work for many industries and their solutions is for more general use. Therefore, localizing that technology for DoorDash's needs becomes more expensive. Building this platform is one of the goals of our company. The goal is to be independent in robotic solutions. Therefore, even if competetors are better in some of their solutions, we have to still gain our goal.

Roadmap and Vision

Roadmap Pillars

Where do we go from here?

- A robot monitor and control system which is localized to DoorDash needs and requirements.

- Theme1: AI monitoring and Control System
- Theme2: Simple Control and Monitor System.
- Theme 3: End User for Entering AMR Market.

AI monitoring and Control System

AI System

- AI in recognizing the problem.
- AI in suggesting the solution, before operator acts.

Simple Control and Monitor System

Simple Model

- System is capable of monitoring Robots.
- System needs an operator totally to solve a problem.

End User for Entering AMR Market

High UX Output

- A highly graphic smi-full feature UX design to be sold in AMR market.
- Technicality could follow either of the methods in themes one or two.

Where do we go from here?

Widening the scope

- Fully automated delivery robots.
- Finding advanced AI solutions to reduce cost and time of each delivery.
- Marketing our solutions to others, and being leader in the industry.