A Case study on Ola: A look at the data that goes through this cab service.

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**Abstract**

Over the recent years, there has been a surge in applications that provide an interface for users to hire taxi/cab services, like Uber and Lyft. In the Indian context, the pioneer of this service is Ola, which is also the most widely known Indian cab aggregator company. Since the company operates on a huge scale, they generate a huge amount of data, which needs to be handled well so that it can be used for big data solutions to take smarter, and more data driven business decisions. In this paper we will look at some of the techniques that Ola; and its competitors use in order to excel in this field.

**Introduction**

Ola is the first cab aggregator company of Indian origin and has made availing cab services a smooth experience. Owned by ANI Technologies Pvt. Ltd. and formerly known as OlaCabs, Ola was launched in December 2010, and is now valued at 6.2 billion dollars as of October 2019. Ola bridges the gap between cab owners and commuters, by partnering with a large number of taxi drivers and owners and adds a touch of modern technology, by allowing people to book cabs at a short notice through Ola's app. This is largely powered by Artificial intelligence and machine learning algorithms, along with Data analytics and visualization tools. For a ride service application like Ola, a huge amount of data is generated every day. This data needs to be harnessed in order to convert meaningless data to actionable business decisions.

**About Ola & the amount of data generated.**

Ola is a company that works on the simplification of the process of cab booking. Once a customer is acquired, they use a variety of techniques for seamless customer experience such as easy payment options, keeping the passenger entertained (Ola Play), among others, to ensure a smooth ride. Ola also operates self-driving cars, though this functionality is currently not available for the Indian scenario. The company offers a wide range of cars to choose from depending on the number of travelers, budget, and convenience. For traveling within the city, one can hire shared taxis, autos, bikes, and even e-rickshaws through Ola. One can opt for ‘Ola outstation’ to travel outside the city and ‘Ola rentals’ to rent a cab on an hourly basis. Ola has also launched ‘Ola select’, a subscription-based membership program that offers premium benefits on rides. 'Ola pedal', Ola’s bicycle-sharing service, is already a big hit in the IIT Kanpur and the IIT Madras campuses with over 500 cycles.

In 2016, Ola launched ‘Ola corporate’. When employees book their rides through Ola corporate, the fare is deducted from the company’s Ola corporate prepaid account. Hence, companies can easily track the travel expenses of their employees while ensuring their safety. Ola also introduced Ola money. The products offered under Ola money are Ola money credit card, Ola money postpaid, Ola money mobile wallet. With the acquisition of FoodPanda in December 2017, Ola also forayed into the cloud kitchen segment.

Ola launched India's first multimodal electric vehicle project on 26 May 2017. The project brought together industry experts and the Indian government to pioneer electric vehicles for the public and promote shared mobility in Nagpur. Ola is providing 200+ electric vehicles for booking in Nagpur through its app. Established as a separate entity, Ola Electric Mobility Pvt. Ltd also reached the unicorn status with $250 million investment from SoftBank in July 2019.

It is pretty clear that Ola generates data in a wide array of fields, in vast amounts, at a scale at which it is impossible to handle everything without the use of artificial intelligence and machine learning tools.

**Business and Revenue Model**

Ola acts as a facilitator to provide cab-booking services. Customers can book their cabs through the app. Ola does not own any of the cabs. Drivers with valid permits duly authorized and verified by transport authorities can sign up with Ola; they could be either self-employed or work for an operator who owns multiple cars.

The drivers have flexibility to decide their own time to login to the Ola application and accept requests for rides from customers. Ola takes a commission of 15% on an average on all the bookings done through the app.

Ola considers the following factors to create the final bill for the user:

* Base Fare - Charged flat.
* Distance Fare - Charged kilometer-wise (different for different cities).
* Ride Time Fare - Charged on the time taken to travel.
* Peak Pricing - Direct ratio depending on the demand for cabs.
* Service Tax - 5.6%.
* Swachh Bharat Tax - 0.2%.
* Toll Charges - Toll Collection in case you cross toll junctions in the journey.

**Uses of AI, Data Science, And ML**

Ola uses AI and machine learning are the fields which are in huge demand nowadays because of their capability to churn through immense amounts of data and transform multiple industries like education, medicine, energy and many more. That is the reason that more and more companies are moving towards AI and ML to solve complex business problems and to make machines do complex tasks that a normal person can’t. One of the few companies who have adopted machine learning is Ola.

Ola acquired an artificial intelligence startup called “pickup.AI” around 2019. Pickup.AI works with some AI-powered technologies like Computer Vision, AI and sensor fusions to provide business solutions. Sensor fusions is basically an ability to use multiple radars, inputs and cameras to form a single image of the surrounding environment around any particular vehicle.

Through seven years of operations, over 14 categories, one million driver partners, and more than 110 cities means billions and trillions of bytes of data and insight into every single decision made by Ola customers, which includes both commuters and driver partners. This includes the type of mobility solution (cabs, auto, share, etc.), time and day of booking, pick up and drop locations, distance travelled, and so much more. Containing so much data, Ola’s business is deeply rooted in data science. Data science helps Ola to understand the kind of aura a traveler prefers in the cab. For example, parameters like infotainment preference, playlist preference etc. really help engineers to understand trends. A few of the innovations include:

1. **Infotainment system by Partnering with Microsoft**

In 2017 Microsoft invested around $200 million in Ola to build a new connected vehicle platform that transformed the experience of passengers with improved car productivity, good navigation features and more.

Cloud-based infotainment with the help of AI was an additional feature that was added. This cloud-based infotainment was implemented using the Microsoft Azure platform which is ultimately used to power Ola Play and connect it with the company’s existing car platform. With this newly added technology by Microsoft, Ola managed to create a pleasant passenger experience.

Some other machine learning based features like voice-assisted controls, office 365, skype – helping customers in making most of their journey. Transforming to data science and ml not only made ola better than its competitors. But also created thousands of ai-related jobs across India.

1. **Ola Guardian**

Ola has one of the most successful AI-powered real-time ride monitoring feature called The Guardian. This feature available in more than 17 cities of India and was first successfully implemented at Perth city in Australia.

The Guardian uses the collected real-time data from rides to spontaneously detect irregular activities by drivers, it also includes prolonged stopping and unexpected route deviations by drivers. In the end, these activities are sent to Ola’s 24/7 safety team. The safety team then looks at this problem, does an analysis of the situation and does a custom check on the passengers to see if they are safe. There is also a feature where customers can also alert police authorities and their closed one as there is an emergency button in the Ola cab. Only using Artificial intelligence and Machine learning can ola quickly find out solutions to these problems. Ola’s guardian is purely built on these technologies which helps it to learn from continuously coming data and to find instant solutions.

1. **Driver Face Detection**

Ola also has also put a real-time face detection system in place for its drivers to avoid impersonation and it makes it compulsory for the driver to upload a selfie and authenticate with the system multiple times between the rides. This recently released feature is live across India and is also being piloted in the international market. This is also one of the applications where ola uses ai and deep learning techniques.

1. **Traffic Modelling**

Ola has collected data from approximately 900,000 cabs on the road which helps them to create an accurate real-time scenario of traffic around the roads. The information of the routes around the road and they use this data to create unique ETA(estimated time arrival) models. Ola also uses AIML tools for modelling traffic and speed conditions to more accurately estimate optimal (less congested) routes that should be taken, which in turn to magnify the commuting experience. Historical as well as current data from these nine lakh cars on the road and analysis of it is used to create an accurate real time picture of traffic conditions across the entire network.

1. **Ola CONNECTS**

In April 2020, amidst the COVID-19 crisis, Ola offered its technology platform and capabilities to Government and Public Service Organizations across the country through its Ola CONNECTS initiative, which stands for COmprehensive Navigation, NEtworking, Control and Tracking Solution. Ola CONNECTS can be deployed as a turn-key solution or customized to specific requirements, to assist governments and its various agencies in managing Real-Time War Rooms for various operations at scale, amidst the ongoing COVID crisis. The platform has capabilities such as Navigation and Real-time tracking, to track millions of enrolled vehicles/people 24×7. User activity can be restricted to specific zones with alerting mechanisms on deviation. Other capabilities include , Real-time Alert System and Crowd and Flow Management, which will enable Scheduling, Flow control and planning capabilities to support social distancing norms. Furthermore, AI-enabled Selfie Authentication will enable the authorities to conduct random checks to ensure all preventive measures like usage of masks are being strictly adhered to.

1. **Other Applications**

The aim of the application of these technologies is to continuously enhance safety, convenience and affordability of our on-demand services and offerings. For customers, OLA focused on solving problems such as keeping our promise on ETAs, before as well as during the ride, price dynamics, personalization, real-time and localized navigation, as well as leveraging data to enhance safety and security. For driver partners, data science plays a key role in optimizing their business potential (for example, maximizing earnings) and encourage entrepreneurship. Other applications involve modelling traffic and speed conditions to more accurately estimate optimal routes that should be taken. Historical as well as current data from nine lakh cars on the road and analysis of it is used to create an accurate real time picture of traffic conditions across the entire network. This vast amount of data is then used to create uniquely accurate and reliable models of ETAs and suggest less congested routes to greatly improve and enhance the commuting experience.

**Innovations by Competitors**

Since companies generally refrain from sharing the algorithms and technologies that they are using in production, it is useful to look at the implementations of other companies (who share their processes in greater detail), and to look at the proprietary software that they have created in order to get a greater understanding of how the industry implements certain functionalities.

1. **Uber’s approach to implementing AIML:**

Uber is another company in the same space as Ola and they have an innovative approach to implementing AI and ML based algorithms in their company. Traditionally, a company would hire Ph.D.’s and data scientists, and each team figures out its own algorithms. Uber instead has hired a team of researchers who are working on creating a way to access machine learning just using web interfaces, APIs and SDKs (software development kits).Thus, the customers of this team are employees who are working inside the company, who can expect this service to run 24/7 for them, with no need to become specialists in machine learning themselves in order to use a functionality.

This team offers about 10 different algorithms, including boosted trees, linear learners and neural networks to their internal customers, so that they have the benefit of taking the algorithm that suits their problems best. They also claim that they are trying to go the open-source path by using Hadoop (massively distributed computing technology), Spark (a large-scale data processing engine from Apache) and MLLib (a scalable machine-learning library).

1. **Uber’s Matching Algorithm:**

In Uber’s matching algorithm, given a pickup location, drop off location and time of the day, predictive models predict how long will it take for a driver to cover the distance. Uber has sophisticated routing and matching algorithms that direct cars to people and people to places.

Uber follows a supplier pick map matching algorithm where the customer selects the variables associated with a service (in this case Uber app) and makes a match by sending requests to the most optimal list of service providers. Any Uber ride request is first sent to the nearest available Uber driver (the nearest available Uber driver is determined by comparing the customer location with the expected time of arrival of the driver). The Uber driver then accepts or rejects a ride request. This matching algorithm works well for Uber since the transaction is highly commoditized i.e., the number of variables that the customer has to decide before a match is made are minimal. Before the ride, Uber uses a mixture of internal and external data to estimate fares. Uber calculates fares automatically using street traffic data, GPS data and its own algorithms that make alterations based on the time of the journey.

1. **Data analytics at Lyft**

Lyft is another company operating in the same market as Ola, albeit in the United States. There is a dedicated data analytics and business intelligence department at Lyft, but depending on the teams and product, the job function may differ a little.

Data science teams at Lyft include:

* Mapping
* Autonomous Vehicle
* Marketplace
* Dynamic pricing
* Growth team
* Rider experience
* Driver experience
* Fraud team
* Airport experience

**Conclusion**

In this study we looked at Ola, and the vast amount of data that they generate because of the array of choices that a user has, along with studying traffic patterns, ride time estimates, fare estimates, safety of passengers etc. Along with this, we also looked at how they have tackled these challenges, and what are some innovations that are happening at the offices of the competitors of Ola. From this, we can surely conclude that the success of apps like Ola is heavily reliant on Big Data technologies such as Artificial Intelligence and Machine learning.

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