



# Operation analytics: Uber and ola logistics optimization

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## ABSTRACT

*Uber and Ola both are one of the most fastest growing firms in the taxi aggregator industry. However, both run through very different operations and working logistics in terms of driver and rides, route optimization, area connectivity, and availability. With this paper, we aim to draw a comparison between daily working and logistics optimization of both Uber and Ola, so as to understand the workings and the shortcomings of both the firms on whole. For this purpose, we have used mathematical and analytical tools of operations research.*

**Keywords**— Uber, Ola, Logistics optimalization, Route optimization, Operations research

## 1. INTRODUCTION

Operational research (or) is an analytical method of troubleshooting and decision-making which is useful in managing organizations. In operational research, problems are divided into basic components and then resolved in the steps defined by mathematical analysis. Uber Technologies Inc. A peer-to-peer ridesharing, taxi cab, food distribution, bicycle-sharing, and transport network company (headquartered in San Francisco, California) with operations in 785 metropolitan areas worldwide (operating in the form of recovery) TNC. [1]. Its platforms can be accessed through its websites and mobile apps. Uber has been prominent in the shared economy, so as a result changes in industries are called Uberisation. Renters have been quoted as saying that they will pay before the ride request. [8] Uber uses dynamic pricing model; Prices vary by estimated time and distance, depending on the time of the day and the time of the ride, depending on the supply and demand for the ride. [9] At the end of the ride, the rider is paid on the pre-selected preference, which can be Google, file, Google Pay, Apple Pay, cash, or credit card in India, Airtel Mobile Wallet [10] Or integrated payment interface. By March 2018, Uber's market share in the United States was 73% as per the second measure, according to an analytics platform, based on credit card data. Uber calculates its market share between 70% and 72% internally in the United States. In March 2018, there were 41.8 million users in the United States of America.

Ola Cabs (styled as OLA), is an Indian origin online transport network company developed by ANI Technologies Private. Ltd. By April 2017, the value of the Ola was \$3 billion. [3] [4]

Ola Cabs was founded on December 3, 2010, in Mumbai as an online cab aggregator, and now it is located in Bangalore. By 2018, the company has expanded into 169 cities network of more than 1,000,000 vehicles. In November 2014, Ola got a variety to include an auto rickshaw on a trial basis in Bangalore. [5] After the testing phase, Ola Auto expanded from December 2014 to other cities like Delhi, Cuttack, Pune, Chennai, Hyderabad, and Kolkata. In December 2015, Ola expanded its auto services in Lucknow, Bikaner, Kota, West Bengal, Mysore, Chandigarh. Indore, Ahmedabad, Jaipur, Guwahati, Vijayawada, and Visakhapatnam. In January 2018, Ola expanded to Australia's first foreign market and eventually planned to run a service in Sydney and Melbourne - arrived in Perth in late February. [6] In September 2018, OLA also announced the expansion of its business by starting operations in New Zealand.

The lowest reciprocal option is available for Rs. 8 per kg and Rs. 35 and the base price of Ola Mini is for the rent of Rs. 12 / km and Rs. 49 (for rates in Pune city). Customer experience - Recover hands down the ways in which they treat their riders are far from light years compared to hail. Drivers - then it gets recovered.

Benefits of recovery and rehabilitation in India:

1. The biggest advantage of Ola / Uber is that it is convenient. A few simple steps on your mobile app and you are good to go.
2. Low price. Usually, the cab prices are equivalent to normal taxi prices which makes it the first choice of the consumer.
3. Easy travel. When you are paying almost the same amount, why not travel in an air-conditioned cab.
4. Option. Want to travel in style, book the SUV or Ola Lux? For those who are not aware of Ola Lux, you can book BMW, Mercedes, Jaguar or any such luxury car for your trip. Book alone, a book on a budget, lower pool or wet stock book. It is sure that the shots are cheap after your black and yellow cab.
5. Revenue for Government. Everything is computerized. Billing, payment, etc. So you have to pay service tax at any cost.
6. Employment Opportunities There are many people who are able to earn their side income by just applying a driver to run their car. And the driver who had no fixed source of income before got it.

## 2. OVERVIEW

Transportation industry in India has transformed over the years in terms of infrastructure, and preferences of consumers. In particular road transportation, has witnessed major changes and improvisations to ensure secure & hassle free commute from one place to another. In fact, at present, it is one of the fastest developing urban infrastructures in India. According to a report published by IBEF, 'India has the 2nd largest road network in the world that spans a total of 4.87 million kilometers and Indian roads facilitate the transport of over 60 percent of all goods and 85 percent of total passenger traffic'. The IBEF report further states that the Indian government has developed a seven-phase program called the 'National Highway Development Project (NHDP)' assigned with the National Highways Authority of India (NHAI), for development of National Highways across the country.

The road transportation segment in India is now being disrupted by several on-demand cab aggregators and commuting services that provide quick, easy, and affordable transport options to customers based on their individual requirements.

The organized taxi sector in India grew exponentially as it was funded by the big investors.

According to a survey by TechSi Research Indian taxi market values at around \$6.4 billion, and is forecasted to grow at a CAGR of 13.7% during 2017-2022 reaching \$14.3 billion.

This increase in demand of taxis can be attributed to a lot many factors such as increasing disposable income of consumers, changing the lifestyle of travelers, the growth of urban population, high traffic on other public transportations, mostly in Tier-I and Tier-II cities, et cetera.

The supply of taxis wasn't able to meet the high demand, hence shortage implying towards the need for a breakthrough in this market and the opportunities left unutilized. All these factors lead to the transformation of this market and allowing taxi aggregators such as OLA and UBER.

The taxi market in India was highly fragmented and unorganized, which comprised of individual car owners and small-scale agencies operating in different cities around the country. The organized Indian Taxi market can be classified into three major segments:

Owners- EasyCabs, MERU

Affiliators- Savaari, taxiGuide.in

Aggregators- OLA, UBER

Basis	OLA	Uber
Launch	2010	2009 (2013 in India)
Valuation	3 billion \$	62.5 billion \$
Fundraising	1.75 billion \$	11.56 billion \$
Key investors	Softbank, Tiger global, DST	Benchmark, Baidu, Saudi Arabia's public investment fund
Tech platform	Application	Application
Presence in number of cities in India	110	29
Number of vehicles on the platform in India	550,000	350,000
Market share in India	Around 65%	Around 35%
Number of employees in India	8000+	200+

Ola and Uber had a customer acquiring spree in India since the past few years because of many reasons such as inadequate public transport system of the country, the ambiguous law of our country and low car ownership.

## 3. OPERATIONS RESEARCH

Operations research, developed by British military forces during the Second World War is a unique approach to quantitative analysis and decision science. It follows a set of structured procedure which starts with the formulation of a problem then making assumptions, then the collection of data takes place followed by the optimal solution to the problem and then its interpretation and implementation. OR has been widely applied in today's world as with the limited sources available the need of the most optimal solution has increased. The tools and scientific approach of OR can be applied in various industries such as manufacturing transportation, telecommunication, financial markets, et cetera.

Now a lot many approaches of OR has been formulated and defined so as to define the best course of action for various industries, some of the approaches are:

- Objective-oriented approach
- Scientific approach
- Decision-making
- Computerized
- Inter-disciplinary approach

#### **OR in taxi aggregator industry**

Operations of Ola and Uber majorly is to allocate and dispatch their respective fleets in a way to the incoming request from customers that allows them to make maximum profit. Operations research is the most useful approach to curb this problem as it calculates the most optimal way to allocate the limited sources, hence the methodology and approach of operations research are widely applied in this taxi industry. In today's on-demand economy where there's logistics of people, food, courier packages et cetera taking place, the allocation has to be done in the most optimal way. The status quo has been abysmal in this industry.

Ola and Uber with their route optimization are reigning in the taxi industry, developments are done in operations research since the Second World War has allowed these service providers to operate the entire fleet as one centralized system. The system gathers the data and delivers the route with multiple pickups and drop-offs intertwined. OR is widely applied in the taxi market of India as it efficiently curbs the problems of this industry in our country.

#### **4. LITERATURE REVIEW**

Route optimization is finding the shortest total riding time, given a fleet of cars and a number of orders with their constraints. This is likewise referred to as the Vehicle Routing Problem. Each picture in time may be considered a routing trouble that we solve for, the results of which become the updated commands for the fleet. It considers all of the statistics and can provide you with routes for drivers that consist of more than one pickups and drop-offs intertwined. More importantly, it allows the entire fleet to perform as one centralized system. It considers each passenger with its precise pickup and drop-off places individually. Because the routing problem is known to emerge as exponentially more hard with size, the extra passengers, the extra automobiles, the extra complicated actual-world scenario is, the clearer it becomes that simple heuristics aren't good enough. (Kuo, 2016)

Scheduling is an allocation of resources to jobs over years to carry out a group of activities. In a very competitive environment, effective scheduling has grown to become crucial for survival within the marketplace vicinity. Scheduling leads to use of resources in an efficient way. The productivity of human sources is another performance metric. Comparison of real versus planned time to determine the providers' manufacturing performance, ability ranges, and service delivery cost. The way orders are generated and scheduled determines the performance of downstream activities and carrier capacity. Order processing has an important effect on the patron's notion of service and purchaser pleasure. Improvement in order processing has a great effect on sales.

Services have sure problems like trouble in reaching standardization and designing carrier and shipping approaches. Service is a process. A system cannot be controlled if its performance cannot be measured. Any performance degree has to maximize effectiveness and efficiency. (G. Venkatesh, 2015)

The company produces what many reasonable observers could outline as a controlled labor force. Drivers have the liberty to log in or sign off of work at will, however, when they're on the line, they are closely monitored. The platform redistributes management functions to semi-automated and algorithmic structures, in addition to consumers. Algorithmic management, but, can create ambiguity around what's anticipated of people — and who's sincerely in rate. Uber has full strength to unilaterally set and alternate the fares that passengers pay, the prices that drivers are paid, and the commission Uber takes. Drivers are alerted to surging zones through map visualization, which indicates where in the call for and fares will temporarily see an upward thrust, by means of a value that would range from 1.5x-9.5x. (Rosenblat, 2016)

It is found from the study that each one the three factors chosen for the study, i.e., price consciousness, coupon redemption behavior, and innovativeness are influencing the customers in their selection of cab offerings. Price consciousness and coupon redemption behavior are found to be related and their relation is noted to be significant. There is stringent competition inside the cab offerings industry and so, the organization wants to attract customers through coupons. The modern consumers are innovative as well as price sensitive, thus, coupon redemption enables for patron retention. (Dr. P. Kishore Kumar, 2016)

Ola has a visible first-rate growth inside the taxi marketplace quarter. There is clearly no looking back for Ola. Revenues of Ola has accelerated almost 10 folds during the last four years. Today, its one of the biggest cab service provider. Ola has successfully executed public help and has created a buzz about its logo inside the marketplace. Furthermore, if a few greater technological development is finished at Ola then the purchaser base may be increased by presenting better experience to the consumer. Ola now has shifted its recognition on target markets and is targeted on providing a preferred carrier to the people inside the target market. The economic segregation depending upon the income group and requirement of the human beings is nicely appreciated. On one hand Ola promotes its brand by using conventional methods and on the other hand, it additionally makes use of the modern-day techniques of advertising. At the same time, it does not neglect its social safety, creating social recognition and selling acts of humanity. The key element in making Ola a hit emblem is the efficient and quick accessibility. So OLA has been and maybe a brilliant generation platform for transportation and offering flexible alternatives of reserving and charge to clients and flexible timings and centers to drivers. (Dr. Ashok Kumar Panigrahi, 2018)

India's foremost attractiveness lies in its marketplace length and accelerated shopping strength resulting in uplifting lifestyles. On the other hand, Indian clients are clever, very demanding and rather price-sensitive without a brand loyalty; handling such marketplace isn't an easy assignment. Companies have to continuously be on their feet and keep designing new programs to allure the clients. OLA and UBER must optimize their charges at all ranges; be greater customer-centric & goal oriented; modern; immune to changes of the government regulation and particularly impress their clients as the client is the king'. (Dr. Ruchi Shukla, 2017)

**Purpose**– The purpose of this paper is to explore the business dynamics of a rising ride-hailing service industry through case study and foster understanding of hypothetical feedback effects within the broader system. **Design/methodology/approach** – The research adopts the dynamic performance management framework with a simulation-based methodology for developing a dynamic case interpretation of the specific type of business complexity.

**Findings**– Scenario analysis shows that changes in the commission percentage for drivers, and cutting prices for customers (car hailers) by competitors have significant impacts on the car-hailing industry. (Davood Qorbani, 2017)

With the detailed review and know-how of the prevailing Cab aggregation enterprise, contemporary state of affairs and troubles, listed below are few of the recommendations that may be considered for implementation:

1. To facilitate the customers who are not but used to the technology the usage of clever phones and cell net, if they may be provided an alternative, that segment of the clients are not lost.
2. Bringing in most drivers into the community giving them the right schooling on how to behave with the customer's right from receiving them at the same time as they board will assist in building the brand loyalty.
3. With the introduction of the Surge pricing, the affordability component is lost. Companies have to study methods like increasing the no. of kilometres served in a day to increase their sales as opposed to trekking the prices all at once.
4. Introduce the idea of journey miles for dependable customers; these will attract the clients to stay at the community for the long term. (Mr. Sai Kalyan Kumar Sarvepalli, 2016)

## 5. ANALYSIS

### 5.1 Secondary data analysis

- For this article, the research is based on the previous data provided.
- The data is collected presents the data on the integral logistics working of Uber and Ola.
- It is based on the data collected from various sources including newspaper articles, online journals, articles, and research papers.

### 5.2 Factor and Derived Analysis

In the taxi aggregator industry, the major logistics are concerned with the recruitment of people, assignment of jobs and rides to the driver, area connectivity, and the time is taken to reach the destination and route chosen.

### OLA CABS

Recently Ola signed an agreement with the Haryana Government in which they would be providing jobs to over 35,000 people. The agreement is to ensure professional growth and skill training of individuals. In assignment o jobs Ola is not very well optimized as according to the data collected and upon survey, it was found out that Ola cab is not as readily and conveniently available. This is mainly because Ola provides a wide coverage area however the availability is not compatible with demand. The rides are decided upon the driver's discretion and the drivers are paid a part of the earnings as a commission, however, many times the rides are overlapped due system issues. The area expanse covered b Ola is a lot more than Uber as it is present in 110 cities however the assignment of jobs is not very optimal, also he advertisement reach of Ola is much less as compared to Uber. Ola has also several times been rated badly as the drivers take too long to reach the destinations and sometimes take a longer route than necessary.



Company	No. of vehicles	% Market Share wrt no. of rides
OLA*	2,00,000	49
MERU	20,000	12
UBER	1,50,000	35
Others	-	4

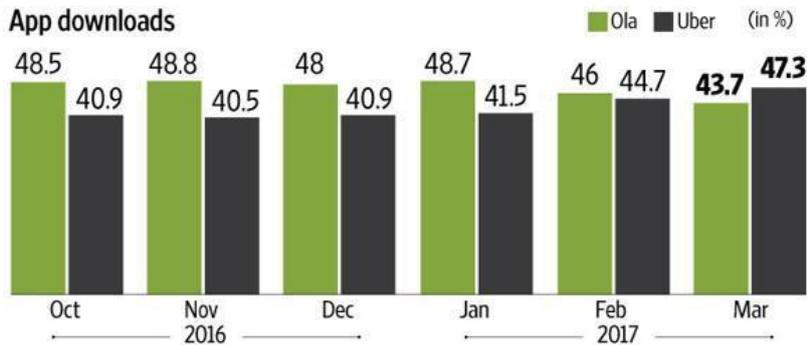
### UBER

Uber India, is not as established as compared to other countries, however it is still of the fastest growing taxi and cab service company of India. For assignment of jobs Uber only targets the closest available driver, however, it is upon driver's discretion whether to accept the ride or not. The drivers are individually paid for the trip on which they earn a commission and can complete as many as trips they like. However, systems operation of Uber in India is still quite weak as many times the driver app crashes. Also, Uber is far less connected in India as it is only present in 29 major cities of the country, thus decreasing its market reach

drastically. Were Ola has a market share of approx. 65% Uber only serves the remaining 35% due to its lack of connectivity in many areas. Uber is known for its quick responses and highly skilled drivers who are well versed with the cities. Also known for is quick processing of feedback and expected responses.

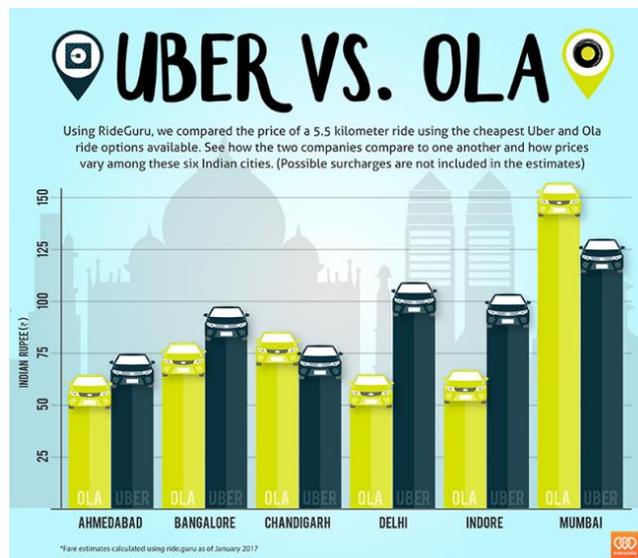
## TIGHT RACE

Uber accounted for 47.3% of all cab-hailing apps installed at the end of March, higher than the 43.7% for Ola



Source: KalaGato

Surge price optimization also is a crucial factor that affects the demand and cost of the taxi aggregator industry.



As we can see in many cities surge pricing optimization is close, but mostly Uber has a higher rate of surge pricing due to limited cars available. However, in Mumbai Ola has a higher surge pricing rate than Uber, this is because of the lesser area coverage

## 6. CONCLUSION

- Ola and Uber had a customer acquiring spree in India since the past few years because of many reasons such as inadequate public transport system of the country, the ambiguous law of our country and low car ownership.
- Operations of Ola and Uber majorly is to allocate and dispatch their respective fleets in a way to the incoming request from customers that allows them to make maximum profit. Operations research is the most useful approach to curb this problem as it calculates the most optimal way to allocate the limited sources, hence the methodology and approach of operations research are widely applied in this taxi industry.
- Surge price optimization is a crucial factor that affects the demand and cost of the taxi aggregator industry.
- We can also say that uber has a higher rate of surge pricing than Ola due to lesser availability of cabs.

## 7. REFERENCES

- [1] Rouse, M. (2011, March). What is operations research (OR)? - Definition from WhatIs.com. Retrieved September 21, 2018, from <https://whatis.techtarget.com/definition/operations-research-OR>
- [2] Chauhan, K. (2018, August 8). Operational Research. Retrieved September 21, 2018, from <https://apkpure.com/operational-research/com.swastik.operationalresearch>
- [3] Aggarwal, A. (2016). Which is better: Uber or Ola? Why?. Retrieved from <https://www.quora.com/Which-is-better-Uber-or-Ola-Why>
- [4] Ola Cabs. (2018, September 21). Retrieved September 21, 2018, from [https://en.wikipedia.org/wiki/Ola\\_Cabs](https://en.wikipedia.org/wiki/Ola_Cabs)
- [5] Uber. (2018, September 19). Retrieved September 21, 2018, from <https://en.wikipedia.org/wiki/Uber>
- [6] Kejriwal, V. (2017, July 05). Future of Intercity cab industry in India. Retrieved September 21, 2018, from <https://yourstory.com/mystory/8819d3326d-future-of-intercity-cab-industry-in-india->

- [7] Seer, R. (2014). *Taxi market in India: Driving into the future* [Ebook]. RedSeer Consultancy. Retrieved from <http://www.redseerconsulting.com>
- [8] Zhou, I. (2018, January 20). Uber Driver Schedule Optimization – Towards Data Science. Retrieved September 21, 2018, from <https://towardsdatascience.com/uber-driver-schedule-optimization-62879ea41658>
- [9] Economy, U. (2016, February 13). How Does Ola Make Money - Business Model of Ola Cabs. Retrieved September 21, 2018, from <https://unicornomy.com/how-does-ola-make-money/>
- [10] Mukherjee, A. (2017, September 01). How Uber and OLA Transformed the Indian Taxi Industry. Retrieved September 21, 2018, from <https://soapboxie.com/economy/How-Uber-and-OLA-transformed-the-Indian-taxi-industry>
- [11] Kuo, M. (2016, March 24). Taxi Dispatch Algorithms: Why Route Optimization Reigns. Retrieved September 21, 2018, from <https://blog.routific.com/taxi-dispatch-algorithms-why-route-optimization-reigns-261cc428699f>
- [12] Venkatesh, G., & Easaw, G. (2015). Measuring the Performance of Taxi Aggregator Service Supply Chain. Retrieved from <https://www.sibm.edu/assets/pdf/samvad10/measuringtheperformance.pdf>
- [13] Rosenblat, A. (2016, April 07). The Truth About How Uber's App Manages Drivers. Retrieved September 21, 2018, from <https://hbr.org/2016/04/the-truth-about-how-ubers-app-manages-drivers>
- [14] Kumar, Kishore & Namavaram, Ramesh. (2016). A Study on Factors Influencing the Consumers in Selection of Cab Services. *International Journal of Social Science and Humanities Research*. 4. 557-561.
- [15] Panigrahi, D., Shahi, S., & Rathore, A. (2018). Success Story of a Start-up – A Case Study of OLA Cabs. *IOSR Journal Of Business And Management*, 20(2). Retrieved from <http://www.iosrjournals.org/>
- [16] Shukla, R., Chandra, A., & Jain, H. (2017). OLA VS UBER: The Battle of Dominance. *IOSR Journal Of Business And Management*, 1. Retrieved from <http://www.iosrjournals.org/>
- [17] Qorbani, D., Yamaguchi, Y., & Cosenz, F. (2017). Analyzing Business Dynamics of Ride-Hailing Services. *The International Conference Of The System Dynamics Society, Cambridge, Massachusetts, USA (2017)*. Retrieved from <https://www.systemdynamics.org/assets/conferences/2017/proceed/papers/P1154.pdf>
- [18] Sarvepalli, S., & Prakash, N. (2016). CAB AGGREGATION INDUSTRY IN INDIA – AN OVERVIEW, CURRENT SCENARIO, ISSUES AND POSSIBILITIES FOR CONSOLIDATION. *IJS DR*, 1(4). Retrieved from <http://www.ijdsdr.org>
- [19] Dash, S. (2018). Can Ola Beat Uber on the Indian Roads? Retrieved from <https://www.entrepreneur.com/article/311111>
- [20] Russell, J. (2015, October 02). How Ola Cabs is Battling Uber in India. Retrieved September 21, 2018, from <https://thenextweb.com/in/2014/07/10/taking-on-uber-in-india-how-ola-cabs-is-thinking-local-to-battle-a-giant/>
- [21] Ganapathy, V. (2016). Case Study: The Uberisation of Supply Chain. *SIBM Pune Research Journal*, 10. Retrieved from <https://www.sibm.edu>