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UBER: Redefining Transportation

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Abstract: This article in the form of a case study narrates the stupendous success of Uber's business model in a short span across geographies. Uber has been successful in defying the norms associated with the transportation segment using innovative practices and extensive data mining algorithms. However, it has not been easy going all along for Uber, given the fierce competition in this segment and legal obstacles on the way.

Keywords: Transport, Technology, Disruption, Innovation, Data, Algorithm.

I. INTRODUCTION

In 2009, Travis Kalanick and Garrett Camp developed a smartphone application to connect drivers-for-hire with people wanting rides to a destination in their city and named it UberCab Inc. It was rechristened Uber Technologies Inc. in 2010. Uber has expanded its operations to 66 countries and 545 cities around the world and is valued at around \$68 billion as of August 2016. The company has derived stupendous success and is aggressively expanding both within the United States and worldwide.

II. UBER SERVICES

The Uber business model leverages the increased usage of smartphone technology by consumers worldwide and links them with independent drivers owning cars. Uber offers such independent drivers an opportunity to earn money as long as they have a car while also offering transportation for consumers at a competitive cost. Uber technology-based services are summarized in a tabular form in Table-I below. New services like UberFRESH are allowing Uber to diversify and expand its footprint worldwide.

Table I: Uber Variants

Brand	Service	Feature
Uber	Cab	Transportation Technologies
UberX	Cab	Non-Luxury cars, low budget
UberXL	Cab	Inexpensive SUV car service
UberPOP	Cab	Private car owners
UberBLACK	Cab	Executive Luxury sedans registered commercially
UberSUV	Cab	High-end professionally driven SUVs
UberTAXI	Cab	Partnership with local taxi
UberLUX	Cab	Luxury Sedan with professional driver
UberPOOL	Shared Cab	Ride share with split fares
UberRUSH	Logistics	Courier package delivery
UberFRESH	Logistics	online Food orders
UberEATS	Logistics	On-demand meal delivery service

In March 2015, Uber Technologies Inc. entered into a strategic partnership with Times Internet Ltd. (TIL) with a view to expand its business in India – its largest market outside the U.S. Uber is a perfect example of an innovative business model

relying on Big Data that utilizes location technology and smartphone capabilities. When a customer wants a ride, drivers in the locality get notified, arrival time, ride fare and duration are predicted, all based on the optimal route depending on the time of day. Uber's affordable private transportation service, combined with safety features and convenience has enabled it to grab a significant share of the market in the Indian transportation sector dependent on traditional yellow taxis, auto rickshaws or public transportation modes like buses or trains. India's cab business may be worth \$7 billion by 2020.

Platform-based models like Uber have the potential to disrupt established markets and promote almost invincible competitive advantage. Travelers today carry smartphones wherever they go. Smartphone-based crowdsensing can be used to collect and aggregate traffic information for services that contribute to sustainable transportation and traffic. Multisided platforms can grow very rapidly especially if the presence of users on one side (Uber drivers) attracts more users to another side (Uber travellers) creating a positive feedback loop. The success of two or multi-sided platforms often depends on how well they balance the benefits and costs to all the sides of the platform while fostering positive network-effects between the sides. Uber's leveraging of spare capacity by recruiting private automobile owners to drive for hire in their spare time not only employs the assets of car_time but also provides extra value to each party to the transaction. Uber thus leverages third party assets not only to create revenues, but to enhance service and develop innovations that customer's value.

III. UBER CHALLENGES

Uber, however, is increasingly facing challenges in the form of legal and regulatory, social, and technical obstacles. The taxi industry, for instance, argue that Uber rides on an unfair advantage as it does not face the same licensing requirements that they do. The number of disgruntled drivers could be difficult to control if Uber decides to further increase its profit share deductions. Recent laws mandate healthcare insurance coverage for drivers. Uber is often accused of not having a stringent driver screening process, thus compromising with the security of its passengers. Uber's operations were banned in the National Capital Region (NCR) of Delhi following the alleged rape of a female passenger by an Uber driver in December 2014. Thereafter, the company introduced two new safety options in the form of a "Panic Button" and a "Safety Net" in its network in India.

While the "Panic Button" allowed passengers to notify the police during emergency, the "Safety Net" allowed the passengers to share their trip and locational details with more persons. Uber also had a problem initially complying with RBI regulations with regard to the mode of payment provided which got sorted out after its partnership with Paytm. It also had a run-in with the Government of India on avoiding service tax obligations. Its "Surge Pricing" technique has been criticized for claiming astronomical fares during peak hours. "Surge Pricing" helps Uber multiply its revenues because the company keeps 20 percent to 25 percent of its average rides' price. However, the management justifies the system of measuring supply (Uber drivers) and demand (passengers hailing rides with smartphones), its inbuilt algorithm determining fares for specific occasions. Some customers complain of long waits, inexperienced drivers, and even sexual harassment, besides the usual problems involving service and pricing issues. Moreover, two-way rating system on Uber helps maintain a great experience for riders and driver partners alike. Drivers are given two opportunities to fall below the ratings threshold and attend retraining. If drivers miss their ratings threshold for the third time, their account is permanently deactivated.

Uber faces tough competition in large markets like USA (Lyft), China (Kuaidi) and India (Ola). The Indian market is largely unorganized and organized players like Uber, Ola, EasyCabs, Meru and others enjoy just 10% of the \$15 billion valued market#. Both Uber and Ola are constantly accusing each other of poaching their drivers. Uber recently sued Ola for \$7.5 million to compensate for lost revenue and goodwill, alleging creation of about 94,000 fake user accounts with the ride-hailing service and used them to make more than 405,000 false bookings. Increasing customer demand for 'rides-for-services' is a continuous challenge confronting both the digital platforms. In their quest for increased customer base and revenues, new products from these cab apps include auto-rickshaws (3-wheelers), bikes, bus shuttles and e-rickshaws. However, customers in this segment are wary of downloading apps, and there have been cases of online frauds like hacking credit card information.

Uber could do well to upgrade its database security system to reduce information risks pertaining to finance and related privacy issues.

IV. UBER ANALYTICS

Uber, however, is a fantastic example of an entity using data science to reinvent transportation. Right from the time a prospective customer expresses his or her desire to move from one point to another, predictive models come into play while estimating fares, show up surge prices and heat maps. Most of the predictive models at Uber follow the business logic on which things like pricing decisions are made based on sophisticated matching algorithms that direct cars to people and people to places. While Uber helps customers to get to their destination, it also collects valuable information about their choices and behaviors. This would go a long way in establishing Uber's customer service level to a new high, reaching out to associated businesses like airlines and restaurants.

Uber's surge pricing model, Geosurge, is based on both geo-location and demand for a ride to position drivers efficiently. Data science methodologies are extensively used to analyze the short-term effects of surge pricing on customer demand and long-term effects of surge pricing on retaining customers. Uber makes use of regression analysis to find out which areas will be the busiest for activating surge pricing to help get more drivers on the roads. The machine learning algorithms have the capability to take in multiple data inputs and predict where the highest demand is expected so that Uber drivers can be redirected there.

Sharing information as well as resources, seems to be the characteristic of the future mobility. Consequently, the definition of "public" transport is also evolving. A few clicks in the Uber website and your car transforms into a taxi. Uber is focused on creating new value for customers and is aggressively pursuing both market-creating and sustaining innovations. Some of this innovation creates massive disturbance in the marketplace, even if it is not "disruption from the bottom" in the classic sense of the term defined by Clayton Christensen. However, one can expect a tsunami of disruption in the transportation sector if Uber's premonition of self-driving cars in the near future come true. Uber has certainly influenced the taxi and transportation industry, and is one of the many businesses looking at leveraging Big Data and Cloud Computing in a big way.

V. CONCLUSION

The introduction of public transport IT solutions pose significant challenges beyond operational issues and modeling passenger flows for aggregators like Uber. Technological issues seem to be less of a problem than legislative and organizational issues. However, one big takeaway from this article is the crowdsensing-based transportation services that can contribute to smoother and sustainable transportation in the years to come.

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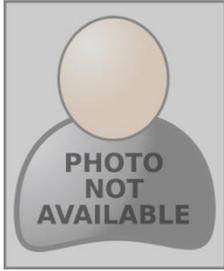
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