BIG DATA ANALYTICS IN UBER

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ABSTRACT

With the help of their ride-sharing software and ability to avoid regulations, Uber has grown from a start-up to a worldwide behemoth that is competing with conventional taxis in more than 700 Metropolitan regions. The taxi business has significantly improved and expanded. One of the most well-known taxi firms in the world, Uber provides a wide range of services in several American cities, India, and European cities. It is the business that provides good employment for drivers and excellent services for passengers.

Keywords: Time series, data analytics, supply and demand, taxis, ride hailing apps and big data

I. INTRODUCTION

Based in San Francisco, Uber Technologies, Inc. (Uber) offers mobility as a service, ride-hailing, food delivery through Uber Eats, package delivery, courier services, and freight transportation. Garrett Camp, a programmer and co-founder of StumbleUpon, and Travis Kalanick, who had previously sold his Red Swoosh firm for $19 million in 2007, established Uber as Uber cab in 2009.

When considering transferring passengers or making deliveries, Uber is the top option for individuals all around the world. It closely tracks which service features are most frequently utilized, examines usage trends, and decides where the services should be more concentrated using the user's personal data. Due to Uber's emphasis on supply and demand, the costs of the services offered fluctuate. Therefore, surge pricing is one of Uber's primary uses of data. Uber depends entirely on data. The quality of their data is absolutely essential to their overall mission and viability.

Data is Uber's most valuable asset, and the core of its business strategy is based on the big data idea of crowdsourcing. Although it is challenging to learn enough about Uber's massive data architecture, we do have some fascinating facts about it here. Uber processes the data that is kept in a Hadoop data lake using Spark and Hadoop. The event messaging system of Apache Kafka, SOA database tables, and schema-less data storage are just a few of the databases and data types from which Uber obtains its data. Uber is a voracious data consumer, and owing to a number of free or inexpensive alternatives like Hadoop and Spark.

When a user requests a car, their algorithms employ a big driver database to match users with the most suitable drivers within a 15 second window to the nearest drivers. Uber gathers and analyses information on every trip its users take, utilizing the information to predict demand for cars, set rates, and allot enough resources. The Uber data science team also carefully analyses the public transportation networks in various cities so that it may concentrate on those with poor transportation and use the data as effectively as possible to enhance customer experience.

II. EXISTING STATUS

Private companies like Ola, Didi, Lyft, Taxify, and many others make up the current system. In comparison to Uber, these services are offered in fewer countries. These systems just allow you to rate your interaction with the firm and the driver. These offer worse possibilities for payment splitting and we must be careful with the features such as dependability and safety. Surge pricing, in which rates increase when demand is higher, is still present in many ride-hailing apps.

III. PROPOSED METHODOLOGY

This methodology is well-known, follows history, and provides a wider range of choices.It also provides a transparent platform to start and accomplish the rides with a rider, driver, and admin feature. It provides premium cars compared to other services. Both the rider and the driver have access to the evaluation and feedback. It is quite dependable, offers services at various price points and according to varied needs, and provides discounts for repeated use.

The key analytical strategic frameworks used in business research, such as SWOT, PESTEL, Porter's Five Forces, Value Chain analysis, Ansoff Matrix, and McKinsey 7S Model are used as Uber methodologies.

SWOT Analysis:

SWOT stands for the organizational terms for strengths, weaknesses, opportunities, and threats. The following is an example of an Uber SWOT analysis:

1. Strengths:
   - First mover advantage and leadership in international markets.
   - Low operating expenses and high degrees of user comfort.

2. Weaknesses:
   - Damaged brand reputation as a result of a number of scandals.
   - The company's losses may get worse.

3. Opportunities:
   - Increasing use of the internet globally and the popularity of the sharing economy.
   - Extending service range and self-driving vehicles.

4. Threats:
   - The potential for further scandals and moral dilemmas.
   - Increasing opposition and reprisals from traditional taxi providers.

PESTLE Analysis:

PESTLE – Political factors, Economic factors, social factors, Technological factors, Legal factors and Environmental factors.

Political issues, such as the never-ending controversies, economic elements, social aspects, such the ease of access, technology factors, legal factors, like banning, and environmental variables, including dubious reactions, all play a role in pestle analysis.

Porter's Five Forces:

Uber's competitive environment and the elements affecting its industry are covered under Porter's Five Forces Analysis. The study focuses on evaluating the company's position in light of factors like the threat of new competitors, the threat of replacement products, the bargaining power of customers, the negotiating power of suppliers, and market competition.

Value Chain Analysis:

Uber's value chain analysis is a strategic analytical technique that aids in pinpointing the company's sources of value and competitive advantage. It involves Uber's core functions, including its operations, marketing, sales, and logistics both inbound and outgoing.

Ansoff Matrix:

Uber uses the Ansoff Matrix, a marketing planning tool, to assist it decide on its product and market strategy. The Uber Ansoff Matrix depicts the four main business plan alternatives. These include product development, market expansion, market penetration, and market diversification.

McKinsey 7S Model:

The Uber McKinsey 7S model shows how seven business components can be coordinated to boost effectiveness. The framework method states that while common values, skills, style, and staff are soft aspects, structure and systems are considered hard elements.

IV. IMPLEMENTATION

Uber's implementation incorporates print and media marketing, sales incentives, experiences and events, public relations, and more. In particular, it relies heavily on word-of-mouth. Additionally, media in general and social media in particular are crucial in raising the levels of brand recognition for Uber on a global basis.

Uber employs sophisticated algorithms and numerous background services. Machine Leaning is the essential element that is enabling it. Uber uses machine learning to provide seamless services and improve customer satisfaction.

1. *Adequate supply and demand:*
   Every day, Uber works with a lot of data. Utilizing both the previously saved and current data from the users' apps, it predicts the location and timing of the demand. The app alerts drivers to satisfy demand requirements in a specific location using these predictions. Uber controls and balances the demand and supply chains in this way, providing customer-focused services.

2. *Estimated fares:*
   Facilitated by machine learning Uber can experiment with prices during busy times to boost revenue thanks to demand forecasting. Since it also affects consumer retention, raising prices is never an easy fix. It examines a number of external variables that might have an impact on the prices, including the accessibility of these public amenities and the availability of public transportation.

3. *Customer loyalty:*
   The demand-supply imbalance may cause cabs to be unavailable, forcing customers to seek other available services to arrange transportation. In order to keep customers, Uber's machine learning-based demand projections are essential. To close the gap between supply and demand, it leverages data from both the past and the present.

4. *Precise arrival time prediction:*
   Uber forecasts the anticipated arrival time using Machine Learning-based methods and real-time traffic, GPS, and Map APIs. When clients reserve rides, specific actions can be done to reduce the projected time of arrival. It constantly works on delivering an improved user experience by cutting down on waiting times.

5. *Optimized routes:*
   To forecast the best routes and suggest the best ones to the drivers, Uber uses a machine learning-based system. It aids vehicles in avoiding congested regions with its precise route optimization algorithm. Traditional approaches did not take into account current traffic, roadblocks, or other meteorological circumstances. All these factors are taken into account by machine learning-based algorithms, which provide the best services.

6. *Uber pool services:*
   Uber assigns the same cab to potential matched rides using machine learning-based algorithms. A system this sophisticated chooses who to pick and drop first. In order to provide its consumers with the greatest services while also managing larger earnings, Uber Pool also uses the stored data to uncover hidden patterns and change costs appropriately.

V. RESULT

As a result, uber is successful because it identified some very particular demands that were left unmet by conventional taxis or automobile services. These three requirements are: request from anywhere, ride in style and ease, and hassle-free payment, as stated on the company's website fairly succinctly. Uber has fundamentally changed the mobility industry as a whole. It is currently one of the most valued businesses in the on-demand industry. It has a market cap of up to $120 billion and operates in 785 cities across the globe. Impressive for a business that grew out of a small local start up.

VI. CONCLUSION

The leader in the taxi services and shared economy is Uber. It is renowned for being affordable and simple to use. In fact, Uber entered the market with a fresh and original concept. It gave clients more convenience and cheaper prices. The end result was that this model and the company's services were well received. Today, it is critical to offer customers high-quality services at reasonable costs. Not everyone has access to the quality they desire. Uber offers fresh viewpoints and opportunities. Uber has the potential to give drivers jobs and give the general public access to transportation. Uber has every possibility to thrive in worldwide marketing, according to the success elements and difficulties described in the current study. Uber is a business that has won consistently before its run of success was broken by difficulties. But in order to maintain its position as the top ridesharing firm in the world in today's competitive and frequently altering business environment, it must now start winning again.

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