HBR Group Case Presentation
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Kamna Kumari (kxk220100)
Rahulchandra Marampudi (rxm220075)
Christena Darsi (cxd230013)
Harshavardhan Kumar Jetty (HKJ220001)

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- Pain Points
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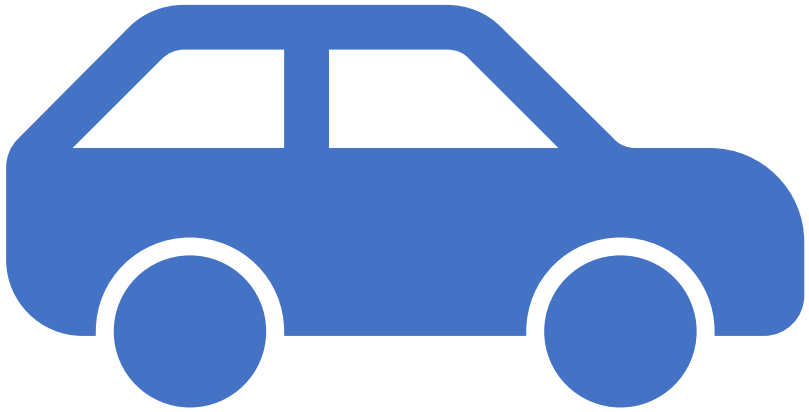
- Improving Pickup experience with automation
- Hypotheses
- Pickup Quality Metrics
- ML Solution for Automatic Pickup
- 7-steps ML Model
- Conclusion
- References

Objective



To improve Uber's customer pickup experience through automation and machine learning

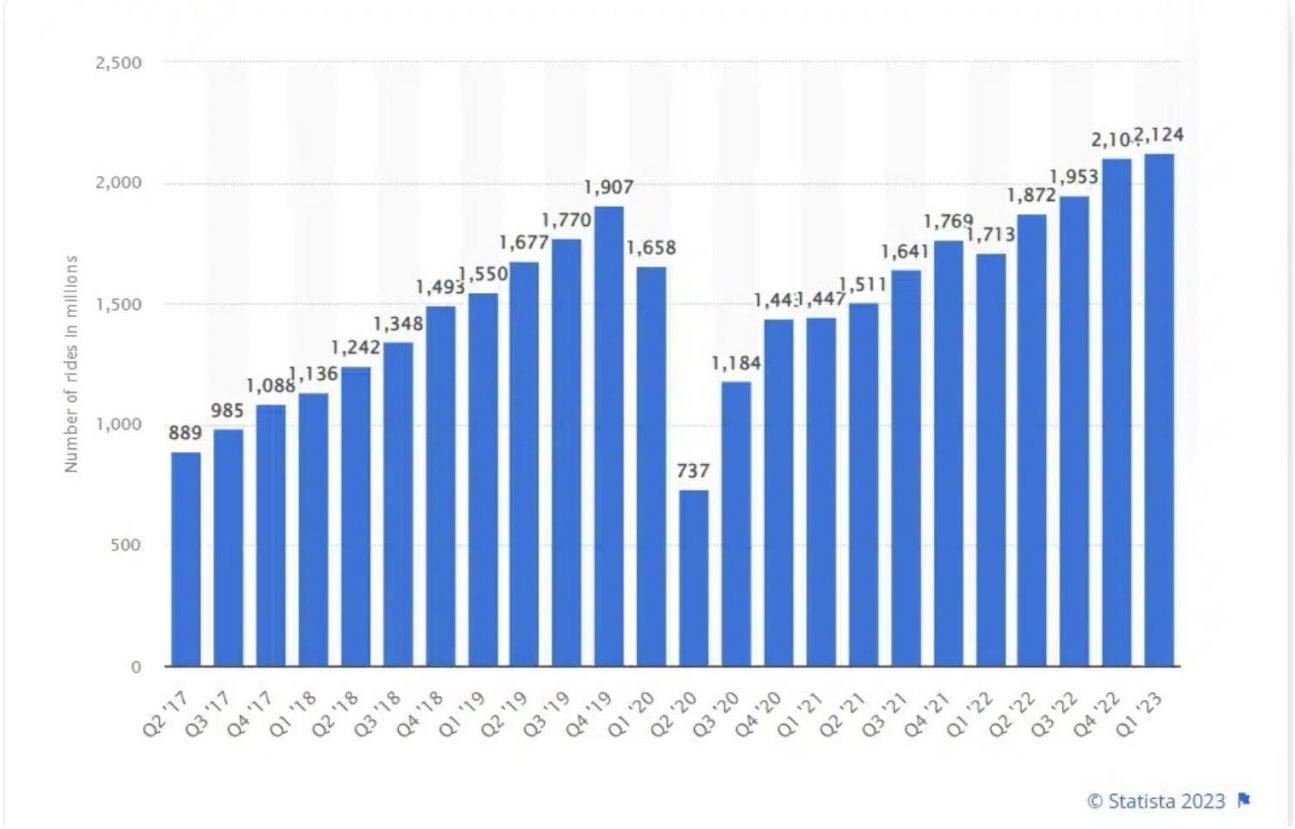
Background

Uber was founded in 2009 by Travis Kalanick & Garrett Camp in San Francisco

It evolved from UberX and Uber Black(luxury cars) to uber Pool(ridesharing) as well as electric bikes & scooter services.

It has also entered the food delivery market Uber eats and Uber elevate for shared air transportation.

As of January 2023, Uber is operational in 90 countries and 10500 cities.



https://www.statista.com/statistics/946298/uber-ridership-worldwide/

Business Model

Key partners

- Drivers
- Restaurants
- National chains
- Tech partners
- Cities / communities
- Commercial partners

- R&D partners
- Investors
- Lobbyists
- Insurance
- Other, e.g. car hire, rewards partners

Value proposition

Riders:
- Custom ride
- On-demand
- ETA prior to ordering
- Low(er) prices
- Convenience
- Safety (improving)

Drivers:
- Income generation
- Work hours: flexible, predictable
- No boss
- App
- Safety/support

Eats VP to consumers:
- Choice
- Discovery
- Convenience
- Order tracking

Customer segments

Riders:
- Younger, urban, medium-high income
- Millennials: long-term

Microsegments:
- Purpose of rides, by routes, movement data

Drivers:
- Part-time, male, multi-homing (Lyft), college+
- By intention: In-betweener, on-the-sider, permanent full-time

Key activities

- Remove frictions
- Improve customer experience
- Reduce risks
- Increase technical lead
- Stimulate participation
- Scale existing cities
- Expand & grow

Key resources

- Network effects
- Active riders / drivers
- Data assets
- Technology assets
- Staff
- Local teams
- Brand
- Digital assets
- Playbooks

Customer relationships

Riders:
- Safety, security, privacy
- Pricing

Drivers:
- Opportunity
- Fairness

Cities:
- "Good citizen"

Channels

- Word-of-mouth
- Media coverage
- Marketing
- Discounts, promo
- Social media, virality
- Partnerships
- Restaurant pages

Cost structure

- Cost of revenue:
  - Insurance
  - Payment processing
  - IT infrastructure
- General & Admin
  - G&A staff, legal, professional services
- Research & development
  - Technology platform
  - Technology programs (AV)
- Sales & marketing
  - Customer acquisition, discounts, promos, etc
  - Driver referrals

Revenues

- Rides (25% commission)
- Eats (15%-30% commission)
- Freight
- Other bets

Driver cost base:
- Depreciation
- Financing costs
- Licenses (if applicable)
- Fuel
- Maintenance, service
- Service tax

https://www.digitalbizmodels.com/blog/business-model-canvas-uber

Pain Points

Let's understand the pain points from both driver and rider's perspective:

- Contextualize
- Assist
- Depict
- Meet
- Navigate
- Track
- Emergency users (Additional)
- Safety alert (Additional)

User Personas

Premium Riders	High-Frequency Riders (HFR)	Occasional Commuters
Ideal Experience:	**Ideal Experience:**	**Ideal Experience:**
Comfortable Vehicles	Reliability, cost-effectiveness, punctuality	Flexibility and ease of use
Accuracy in Location Prediction	Accurate pickup points based on past usage	Intuitive UI and simple reservation
Efficient Route Planning	Real-time traffic updates for efficient routes	Estimate of travel costs and safety features
Outcomes:	**Outcomes:**	**Outcomes:**
Best routes, stress-free and timely arrivals	Simplified pickup process with recommended locations	Predictable pickup points based on past data and user behaviour
Fast pickup response, precise locations, no waiting around	Economic efficiency through shared transportation options and discounts	Cost-effectiveness through shared transportation and customizable packages
Elevated travel experience with high-quality, comfortable rides	Implementation of intelligent routing for real-time traffic monitoring	Ensuring safety through real-time tracking, driver information, and trip details

Improving the pickup experience with automation

- Gathering Information for Anchoring:

Uber used rider inputs and GPS information, among other sources, to determine the initial pickup location.

- Signals for Scoring:

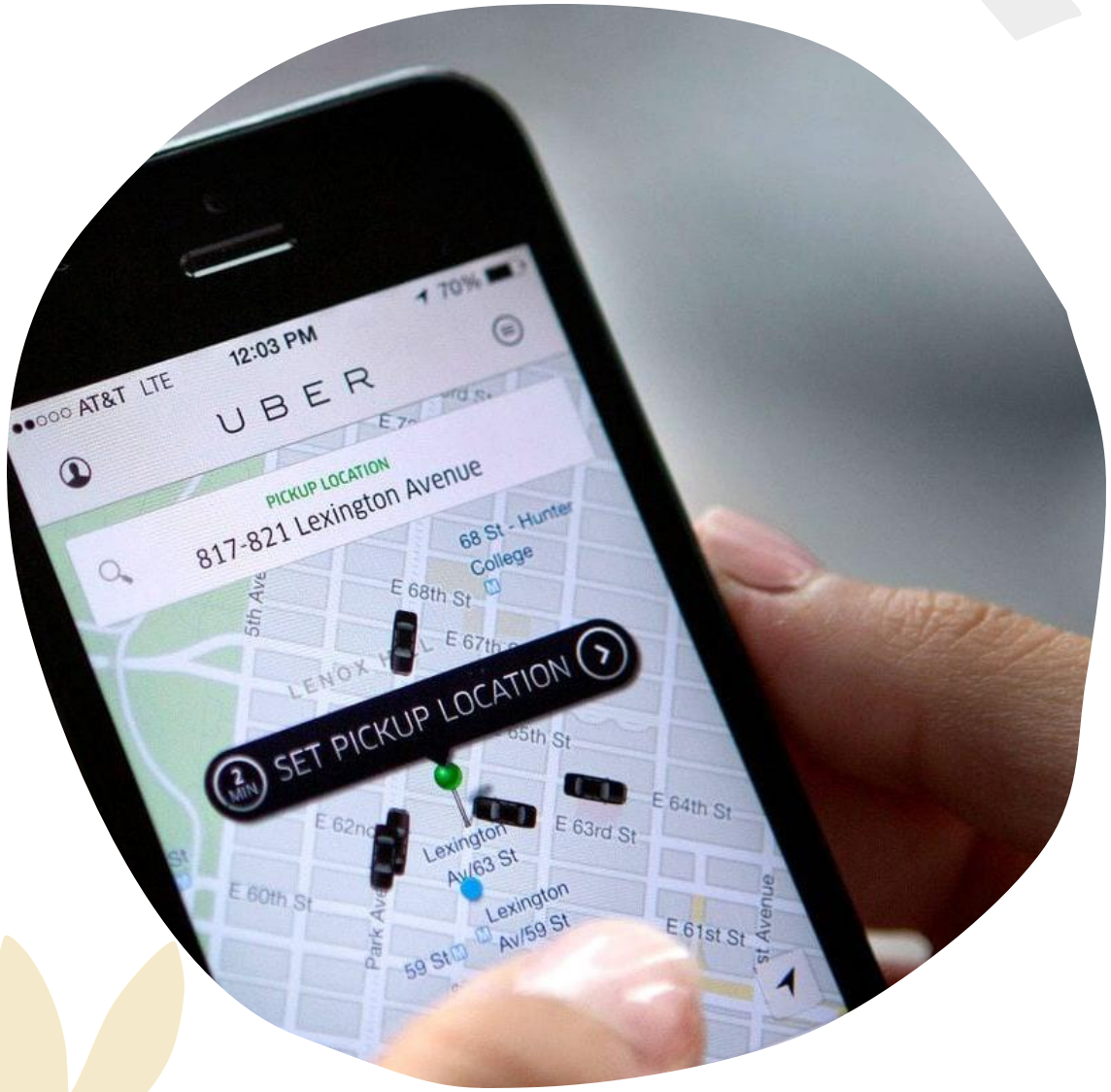
Used a scoring system to establish the degree of anchor location accuracy confidence. Based on the accuracy of the data gathered, high or low confidence scores were assigned.

- Choosing the Location of the Pickup:

The rider was presented with the app's anticipated pin for low-confidence anchor sites, along with a search box for further information.

- Ongoing Improvement:

Continued system improvement by ongoing evaluation of pickup data. Identified trends, such as poor ratings or a high frequency of cancellations, connected to particular recommended pickup locations.

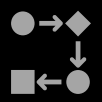


Hypotheses

First Hypothesis: **Predict pick-up locations using sites you usually visit.**	**Method:** Gather data on users' frequent destinations (homes, workplaces, educational institutions).	**Example:** Suggest pickups near these venues.	**Justification:** Streamlines and expedites pickup by leveraging predictable travel routes.
Second Hypothesis: Project Pickups Based on Historical Trends	**Method:** Utilize historical rider trip data for forecasting.	**Example:** Identify frequently travelled routes and areas.	**Justification:** Data-driven approach to estimate pickup locations based on past user behaviour.
Third Hypothesis: Forecast Using GPS Coordinates of Commuters	**Method:** Utilize historical GPS coordinates for accurate pickup forecasts.	**Example:** Minimize manual input by accessing GPS data.	**Justification:** Enhance accuracy and reduce user effort through precise identification of frequent places

Advantages Of Hypotheses

Improved User Experience: By reducing the time and effort users must expend on manual entry, pickup location prediction increases convenience for all.



Enhanced Efficiency: By precisely forecasting pickups, the service may improve driver allocation and minimize user wait times.

Customization: A more individualized experience can be obtained by basing pickup recommendations on personal preferences and frequent travel schedules.

Minimized Errors: By using data-driven strategies, the margin of error in pickup site recommendations is decreased, providing more dependable and accurate service.

Pickup Quality Metrics

Attributes for consideration include:

- Number of Steps to Rendezvous (Passive Signals)
- Wait time
- Number of ETA changes
- Time Spent in Search
- Cancellation Rate
- Safety Incidents
- Customer Complaints/ratings/feedback
- Traffic Conditions (Derived from Third-Party Signals)
- Parking Restrictions (Derived from Third-Party Signals)

Considering Attributes Selection to assign Weights keeping in mind:

- Overall quality
- Universally applied across markets and modalities
- Sensitivity – good & great pickup experience
- Geographical Visualization
- Useful across cities/segments/countries

Assigning weights to the Attributes

Assigning weights to these attributes is a critical step in creating the pickup quality metric,

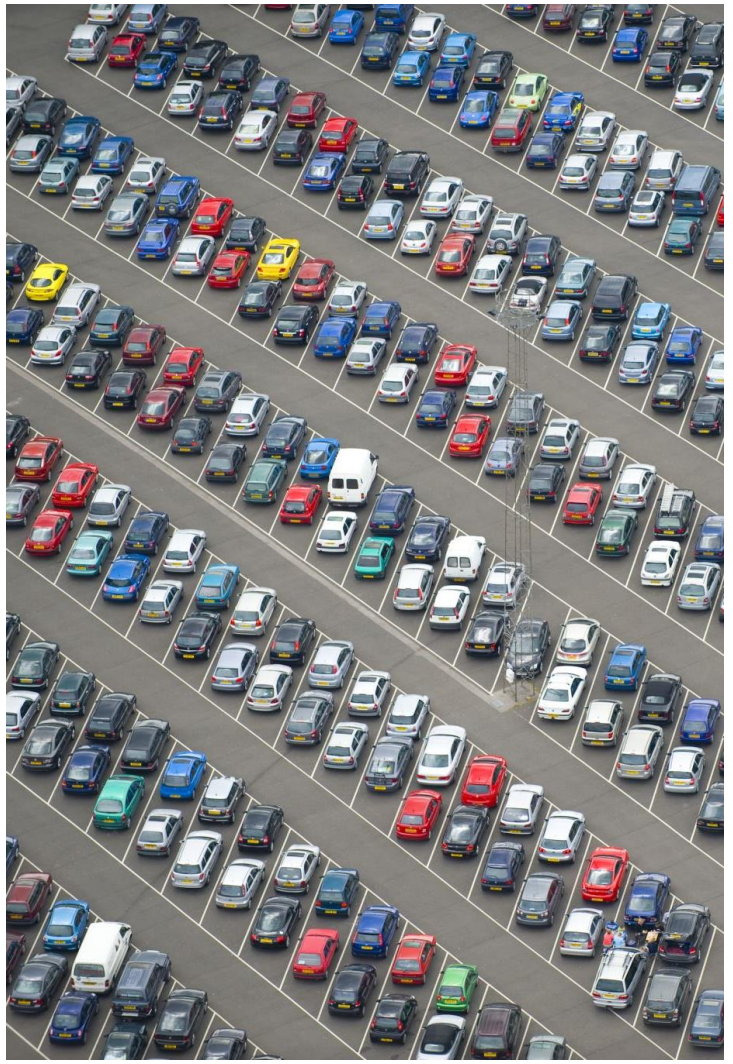
- Number of Steps to Rendezvous: 30%
- Wait time:15%
- Number of ETA Changes: 15%
- Time Spent in Search: 15%
- Customer Complaints: 15%
- GPS data/ Traffic Conditions: 5%
- Parking Restrictions: 5%

Continuous monitoring and refinement are essential to ensure the metric remains relevant and effective.

Improving the Pickup experience based on pickup quality metric

Uber's operations team can take several actions to improve the pickup experience:

- Optimizing Wait Times & Steps
- Enhancing ETA Accuracy
- Minimizing Search Time
- Addressing Cancellation Rates
- Safety Measures
- Customer Satisfaction (Based on Customer Complaints/Ratings/Feedback Attribute)
- Monitoring Traffic Conditions and Parking Restrictions (Based on GPS Data/Traffic Conditions and Parking Restrictions Attributes)



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ML Solution for Automatic Pickup

- Enhanced Efficiency
- Scalability
- Improved Accuracy and Precision
- Dynamic Adaptability
- Personalized Experiences
- Continuous Improvement
- Reduced Human Error
- Competitive Advantage

https://www.dqindia.com/ubers-journey-with-automation-and-ml-in-revolutionizing-operations/

7-Steps ML Model

	Define the business problem to be solved	Enhancing Pickup Experience to increase rider and driver satisfaction.
Business Analyst Leads	**Evaluate if ML is appropriate**	Scalability and Universality: With Uber's presence in numerous global cities, ML is essential for scalable solutions across diverse locations and user behaviors.
	Gather & Label Data	App-generated Data, User Behavior Data Data from Proxy Signals - Device and Location Signals, Network Signals Data from Third-party Sources - Weather conditions, local events, and public transportation schedules.
Data Scientist Leads	**Preprocess data & define features**	Ingest Data from Sensors, Users, and Third-Parties - Data Integration, Normalization Clean Data - Handling Missing Values, Outlier Detection Feature Engineering: Create new features or transform existing ones to improve model performance. Define Objective Function - Define Model Goals - whether optimizing pickup time, accuracy, or matching efficiency.
	Select ML approach & algorithms	Supervised Learning: Utilize labeled data for initial model training and optimization. Transition to Reinforcement Learning: Adapt to real-time dynamics and optimize pickup strategies.
	Engineer features & improve model	Dynamic Routing Optimization: Adaptive navigation based on real-time traffic and user preferences. Personalized Experience Features: Tailored music or content recommendations during rides based on user preferences.
UX Leads	**Make decisions & design user experience**	Journey Personalization: Curate unique ride experiences, such as recommended local attractions or curated playlists. Interactive Voice Assistants: Implement conversational AI to enhance rider engagement and satisfaction.

Conclusion

- While automation and machine learning may overlap in enhancing the pickup experience, their emphasis and perspective differ in each statement.
- The approach to improving the pickup experience for Uber involves a strategic decision on whether to rely on simple heuristics or invest in machine learning.
- Company could exploit the opportunity of creating a model to predict the best location of rider for pickup.
- Right balance is essential for enhancing rider and driver retention and loyalty.

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THANK YOU

Everyone's private driver