Accelerating to net-zero : redefining energy and urban mobility

A Sustainable Approach with Electric Vehicle Cab Service and Life Cycle Management

E-mobility: the fastest and cheapest lever for abating climate change in the coming decade

Making the India the world's first climate-neutral economy will require more than just an energy transition. To cut CO2 emissions by 2070, many sectors will need to make far-reaching changes.

Two sectors that play a key role in society have the leverage needed to do this: power and mobility.

Over the last 10 years, the power sector has made important progress in making the switch to a renewables-based power system.

The road sector, including passenger and freight, dominate transport emissions, accounting for a share of more than 92 per cent of CO2 emissions and electric vehicle technology close to maturity, also this sector can make a major difference in a short time.

Moreover, ambitious climate plans and environmentally conscious consumers are creating a growing sense of urgency.

According to a KPMGIndia report, an estimated 5 crore EVs will hit Indian roads by 2030!

E-mobility: A Silent Revolution

An all-out push to promote the adoption of EVs could be precisely what India needs to meet its target, or nationally determined contribution (NDC), set under the 2015 Paris Agreement.

India has pledged to generate up to 50% of its power from non-fossil sources and reduce the intensity of its GDP emissions by 45% by 2030.

The benefits of EVs become more evident as we get closer to these objectives.

With EV's 'Silent revolution', a paradigm change is currently taking place in the global automotive sector as it endeavours to transition to alternative, less energy-intensive choices.

India is pushing investments in this transition to electric mobility.

One of the main drivers behind India's recent measures to accelerate the transition to e-mobility is the burden of oil imports, rising pollution, as well as international pledges to battle global climate change, as EVs are a better alternative to combustion engine vehicles.

EV Adoption: The numbers

For this segment of the EV industry, the growth road is open and clear. Along with three-wheelers (335,466 units sold in CY2022), electric two-wheelers retails would have gone closer to the 650,000-unit mark in CY2022 and are accelerating the charge of the overall sector. What is adding tailwinds to sales of the eco-friendly commuters on two wheels is the high price of petrol (Rs 106.29 a litre in Mumbai) and regular price increases of petrol-powered scooters and motorcycles due to rising commodity and input costs.

Mutual benefits in the interest of society

Convergence between power and mobility benefits the mobility sector. Being connected to the grid offers opportunities to enhance the consumer experience by providing additional services (besides charging) that are enabled by open data exchange between system operators, market parties and consumers, with their consent of course.

The widespread adoption of electric vehicles in India can bring about significant benefits to society:

1. Reduced air pollution: Electric vehicles produce zero emissions at the tailpipe, leading to a significant reduction in air pollution, which can improve public health and reduce healthcare costs.

 2. Lower greenhouse gas emissions: Electric vehicles emit less greenhouse gases than

gasoline or diesel vehicles, reducing the carbon footprint and contributing to India's efforts to combat climate change.

 3. Increased energy security: India is highly dependent on imported oil, but with electric vehicles, the country can rely more on domestically generated electricity, increasing energy security and reduce vulnerability to global oil price fluctuations..

 4. Cost savings: Electric vehicles have lower operating costs than conventional vehicles due to lower fuel and maintenance costs, providing cost savings to both individuals and businesses.

 5. Job creation: The growth of the electric vehicle industry can create new job opportunities in manufacturing, infrastructure development, and research and development.

6. Enhanced technology and innovation: The adoption of electric vehicles can drive technology and innovation in the transportation sector, which can lead to new solutions for mobility and sustainability

Unlocking India's Potential: Why Auto Rickshaws Should Take the Lead on India's Transition to Electric Mobility

95,000.00
savings per year

85% less
Fuel price

2 times
Earnings per day
From 700Rs to 1500Rs

Auto rickshaws are a popular and ubiquitous form of transport in India that are used by millions of people every day. This makes them a prime target for the transition to electric mobility, as they can be replaced relatively easily with electric rickshaws.

Auto rickshaws are relatively small and lightweight, meaning that they require less energy and fewer resources to power them with electricity than larger vehicles. This makes them more cost-effective and efficient to operate than their petrol-powered counterparts.

Auto rickshaws have been a popular mode of transport in India for many years, and they are well-suited to lead the transition to electric mobility. They are an integral part of the Indian transportation system, and they provide a convenient and affordable means of transport to a large portion of the population.
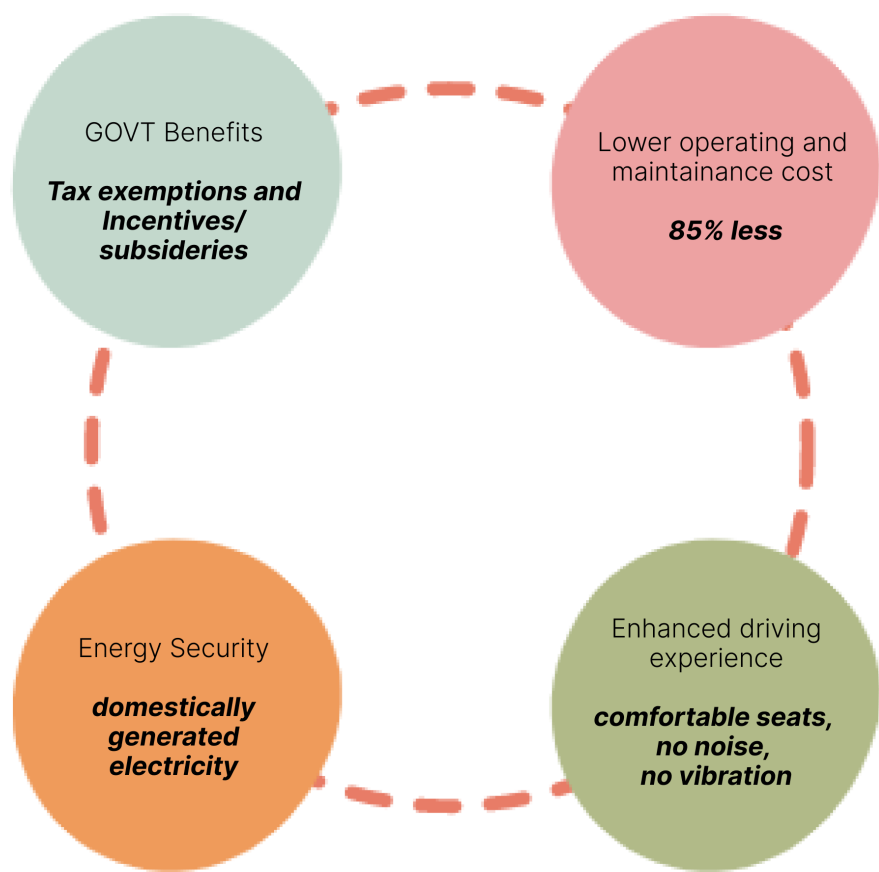
The following are societal benefits on electric auto-rickshaw adoption:

1. Cost savings: Electric auto-rickshaws have lower operating costs than conventional auto-rickshaws due to lower fuel and maintenance costs. This can provide cost savings to both drivers and passengers.

2. Noise reduction: Electric auto-rickshaws produce less noise than conventional auto-rickshaws, leading to a reduction in noise pollution, which can improve the quality of life for residents in cities and towns.

3. Energy security: India is highly dependent on imported oil, but with electric auto-

rickshaws, the country can rely more on domestically generated electricity, increasing energy security.

4. Reduced carbon footprint: Electric auto-rickshaws emit fewer greenhouse gases than gasoline or diesel auto-rickshaws, reducing the carbon footprint and contributing to India's efforts to combat climate change.

5. Enhanced driving experience: Electric auto-rickshaws are generally more comfortable and smoother to drive than conventional auto-rickshaws, providing a better driving experience for drivers and passengers.

Go Green with Government Support: Drivers getting Financial Incentives on Electric Vehicles

1. Tax Benefits: In order to promote the adoption of electric vehicles, the Government of India has proposed to provide income tax benefits to individuals purchasing electric vehicles in 2023. Under the proposed scheme, individuals purchasing electric vehicles will be eligible for a tax deduction of up to Rs. 1.5 lakhs on the purchase price of the vehicle.

2. Subsidies & Incentives: The Government of India is also planning to offer various incentives and subsidies to encourage the purchase of electric vehicles in 2023. This includes providing subsidies of up to Rs. 30,000 on electric three-wheelers.

3. Investment Incentives: The Government of India is also planning to introduce various investment incentives to promote the adoption of electric vehicles.

4. Tax Exemptions: The Government of India is also planning to introduce various tax exemptions for individuals purchasing electric vehicles in 2023. This includes exempting electric vehicles from road tax, registration fees, and other levies.

5. Infrastructure Development: The Government of India is also planning to develop infrastructure to promote the use of electric vehicles. This includes setting up charging stations, developing dedicated lanes for electric vehicles, and providing easy access to financing.

The additional showroom purchase charges for electric vehicles in India are zero. Electric vehicles are exempt from registration charges, road tax, and lifetime tax in India.

The Government of Telangana is offering several benefits to encourage the adoption of electric vehicles:

1. Exemption from road tax and registration fees: The Government of Telangana has exempted electric vehicles from road tax and registration fees.

2. Subsidy on the purchase of electric vehicles: The State Government is offering a subsidy of up to Rs. 1.50 lakh on the purchase of electric vehicles.

3. Subsidy on installation of chargers: The State Government has also announced a subsidy of up to Rs. 30,000 on the installation of electric vehicle chargers.

4. Subsidy on the purchase of batteries: The Government of Telangana is also offering a subsidy of up to Rs. 20,000 on the purchase of electric vehicle batteries.

One EV – limitless possibilities for value creation

We will also have to unlock additional EV value streams in order to reach full mass market penetration. Safari believes that future EVs will no longer only be a means of getting from A to B, but will contribute greater value and become a crucial part of consumers' daily lives, integrating with other assets and services.

In this project at Safari, we are exploiting the potential of EV by creating value in both vehicle life cycle management and cab service provider to meet at a point where scaling it limitless.

Let us explore the various ways vehicle lifecycle management will contribute to a better experience for both the vehicle provider and EV drivers:

1. Optimize EV Charging: Utilize smart charging and dynamic pricing strategies to reduce peak demand and optimize the use of renewable energy.

2. Implement Battery Management: Adopt a comprehensive battery management system to monitor and manage charging and discharging cycles and to extend the life of the battery.

3. Leverage Predictive Maintenance: Utilize predictive maintenance strategies to identify and address potential problems before they become major costly issues.

4. Utilize Vehicle-to-Grid (V2G) Technology: Implement V2G technology to allow EVs to act as a distributed energy resource, providing grid services while reducing overall energy costs.

5. Develop Resale Strategies: Develop strategies to ensure that when the EV is no longer usable, it can be recycled and reused for parts or materials.

6. Educate Consumers: Educate consumers on the importance of EV lifecycle management and proper maintenance of their vehicles.

A framework for the Lifecycle assessment of EVs to consider influencing factors of the use phase. The vehicle is identified as an internal factor; the user, infrastructure and surrounding conditions are defined as external factors. For example, The advantageousness of an aluminium lightweight design changed for a number of countries depending on the parameter value of the influencing external factors and the resulting energy consumption per kilometre. Following the data collection car manufacturers like Mahindra could more precisely define design strategies for their different target markets and governments could include their countries characteristic to environmentally meaningful tailor respective regulation and policies. The necessity to include or exclude these influencing factors in an LCA documentation depends on the defined goal and scope. Improvements of the data management can be achieved by determining quantitative relations between the influencing factors and the energy consumption. Furthermore, the impact of the external factors on the remaining life cycle phases can be analyzed.

The guidelines of the project E-Mobility Life Cycle Assessment Recommendations (eLCAr) aim to harmonise the methodological approach and to enhance transparency of methodological choices. As modern EVs have been introduced to the market recently and there are plenty of ongoing research activities to further develop the necessary key technologies (e.g. for energy storage), most LCA studies focus on vehicle production and related raw material acquisition. Therefore there must be long-time measurements/ monitoring/experiences, this LCAs can address the use phase in particular User profiles that can derive standard driving cycles and the associated energy consumption. Modelling of use phase scenarios based on real life data and especially site specific measurements is essential.

Metering data of an electric vehicle can be useful to an electric vehicle manufacturing firm in a few ways. By compiling and analyzing the data, the firm can gain insights into the performance, durability, and energy efficiency of its vehicles. This data can also be used to improve customer experience by providing feedback on battery life and range. Additionally, the firm can use the data to develop predictive maintenance strategies, diagnose issues, and optimize charging infrastructure. Finally, the data can be used to identify trends in driving behavior, allowing the firm to develop and market more efficient and cost-effective vehicles.

Vehicle Life-cycle Management contribution to the manufacturer and cab service provider party.

Electric vehicles (EVs) are becoming increasingly popular as an alternative to traditional

gasoline-powered vehicles due to their environmental benefits. This presents a great opportunity for electric vehicle manufacturing firms to capitalize on this growing trend and use the data collected from EVs to improve their product offerings.

Metering data can also be used to inform decisions about battery management, such as how long to charge the battery, or how frequently to discharge it.

The metering data of an electric vehicle (EV) can be incredibly useful to an EV manufacturing firm. Metering data is a set of information that records and measures the energy usage of an EV, such as the amount of electricity used, the length of time the vehicle has been driven, and other related details. By having access to this data, an EV manufacturing firm can gain a better understanding of their vehicles' performance and make improvements to the design of their products accordingly. The most obvious use for EV metering data is to improve the design and efficiency of an EV.

By analyzing the data, manufacturers can determine what areas of their EV need improvement and make modifications to increase efficiency. This could include reducing the amount of energy used, increasing the range of the vehicle, or improving the overall performance. By understanding how their EVs are performing, manufacturers can make better-informed decisions when it comes to designing new models and developing existing ones.

Another benefit of having access to EV metering data is the ability to better understand customer needs and preferences. By analyzing the data, manufacturers can gain insight into what features customers are looking for in an EV and incorporate these into their designs. This could include adding features such as longer range, faster charging times, more efficient engines, or other features that are important to customers. Having access to this data can also help manufacturers identify areas where customers are not satisfied with their EV and make improvements accordingly.

In addition, EV metering data can be used to identify patterns in customer behavior. By analyzing the data, manufacturers can determine when customers are most likely to use their EV and make adjustments to their marketing and sales strategies to target these customers. This could include offering discounts or promotions at specific times, or targeting specific demographics with tailored messages. This can help manufacturers better understand their customers and tailor their strategies accordingly.

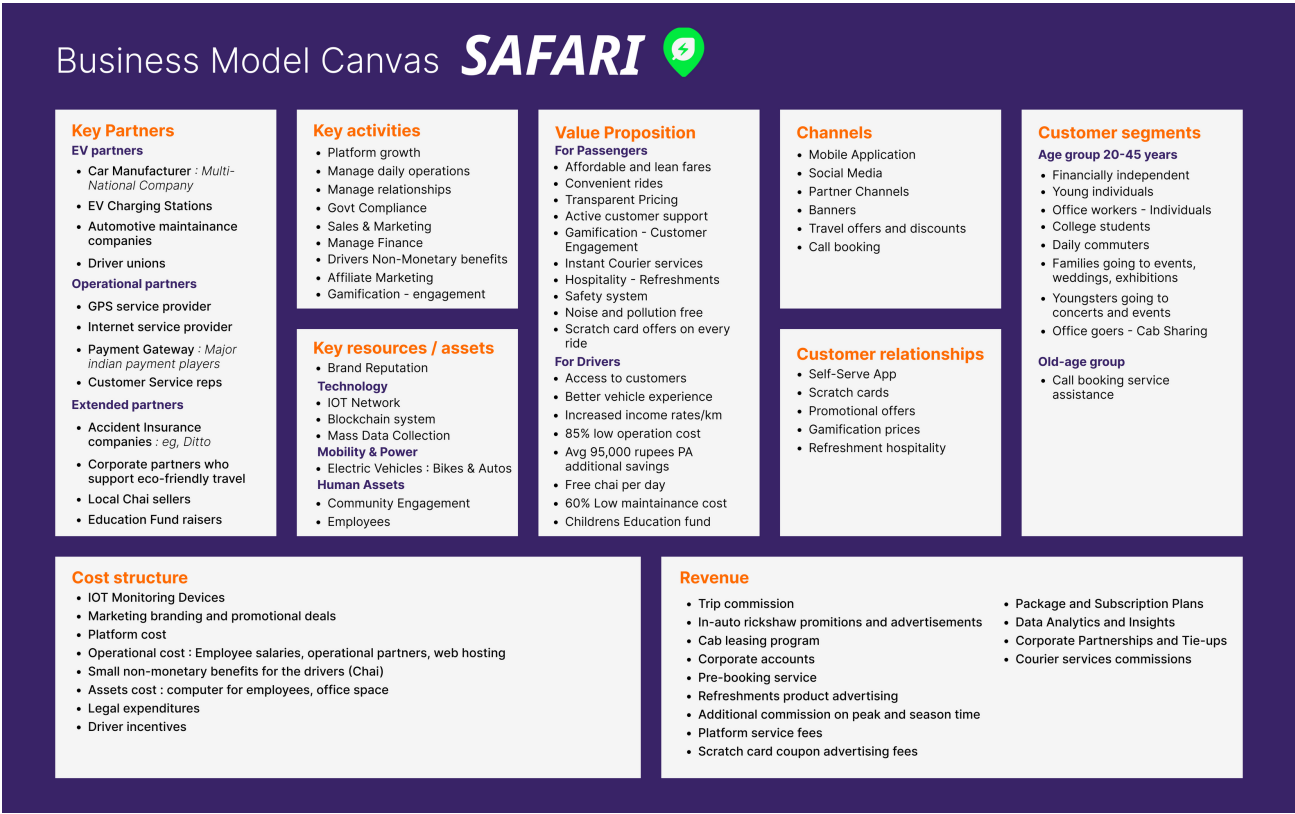**Charging data** refers to the information collected by the charging station about the vehicle's charging status. This data can be used to analyze the time it takes for the battery to reach full charge, as well as the power capacity of the charging station. This information can be useful in determining the best charging practices for different types of electric vehicles and the optimal placement of charging stations.

Location data refers to the information collected by the vehicle's GPS system about the vehicle's location. This data can be used to track the vehicle's movements, as well as its route and duration. This information can be used to create more efficient routes for electric vehicles, as well as to determine the best locations for charging stations. This can be used to recommend an optimal charging point with regards to the latest information recorded on the application.
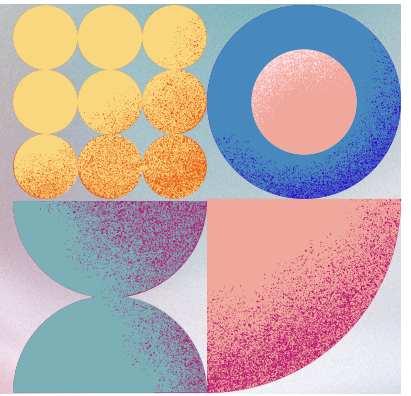
Timing data refers to the information collected by the vehicle's onboard timer about when the vehicle is in use. This data can be used to analyze the vehicle's daily use and identify patterns in usage, such as whether the vehicle is mainly used during peak hours, or if it is mainly used for short trips. This information can be used to improve the design of the vehicle, such as optimizing the size of the battery or improving the power output.

Metering data, charging data, location data and timing data of an electric vehicle are all valuable sources of information that can be used to better understand customer needs and create better, more tailored products. Metering data refers to the information collected by the vehicle's electronic control unit (ECU) about the vehicle's performance. This data can be used to analyze the vehicle's energy consumption, range, power output, and other performance metrics. This data can be used to make improvements to the design of the electric vehicle, such as improving the efficiency of the powertrain, or the range of the vehicle.

Business Model Canvas

Business Model Canvas SAFARI

Key Partners
EV partners
- Car Manufacturer : *Multi-National Company*
- EV Charging Stations
- Automotive maintainance companies
- Driver unions

Operational partners
- GPS service provider
- Internet service provider
- Payment Gateway : *Major indian payment players*
- Customer Service reps

Extended partners
- Accident Insurance companies : *eg, Ditto*
- Corporate partners who support eco-friendly travel
- Local Chai sellers
- Education Fund raisers

Key activities
- Platform growth
- Manage daily operations
- Manage relationships
- Govt Compliance
- Sales & Marketing
- Manage Finance
- Drivers Non-Monetary benefits
- Affiliate Marketing
- Gamification - engagement

Key resources / assets
- Brand Reputation
Technology
- IOT Network
- Blockchain system
- Mass Data Collection
Mobility & Power
- Electric Vehicles : Bikes & Autos
Human Assets
- Community Engagement
- Employees

Value Proposition
For Passengers
- Affordable and lean fares
- Convenient rides
- Transparent Pricing
- Active customer support
- Gamification - Customer Engagement
- Instant Courier services
- Hospitality - Refreshments
- Safety system
- Noise and pollution free
- Scratch card offers on every ride

For Drivers
- Access to customers
- Better vehicle experience
- Increased income rates/km
- 85% low operation cost
- Avg 95,000 rupees PA additional savings
- Free chai per day
- 60% Low maintenance cost
- Childrens Education fund

Channels
- Mobile Application
- Social Media
- Partner Channels
- Banners
- Travel offers and discounts
- Call booking

Customer relationships
- Self-Serve App
- Scratch cards
- Promotional offers
- Gamification prices
- Refreshment hospitality

Customer segments
Age group 20-45 years
- Financially independent
- Young individuals
- Office workers - Individuals
- College students
- Daily commuters
- Families going to events, weddings, exhibitions
- Youngsters going to concerts and events
- Office goers - Cab Sharing

Old-age group
- Call booking service assistance

Cost structure
- IOT Monitoring Devices
- Marketing branding and promotional deals
- Platform cost
- Operational cost : Employee salaries, operational partners, web hosting
- Small non-monetary benefits for the drivers (Chai)
- Assets cost : computer for employees, office space
- Legal expenditures
- Driver incentives

Revenue
- Trip commission
- In-auto rickshaw promitions and advertisements
- Cab leasing program
- Corporate accounts
- Pre-booking service
- Refreshments product advertising
- Additional commission on peak and season time
- Platform service fees
- Scratch card coupon advertising fees
- Package and Subscription Plans
- Data Analytics and Insights
- Corporate Partnerships and Tie-ups
- Courier services commissions

Buisness Requirements Document

Executive Summary

The electric vehicle cab service provider, Safari, in collaboration with electric vehicle cab manufacturer, is to implemented a private blockchain solution that allows cab drivers to maintain digital identity passports linked to their vehicles, while providing the cab service manufacturer with real-time access to cab and service data through a dashboard platform interface. The inclusion of a customer application allows seamless booking of cab services. The objective is to optimize operations, enhance transparency, and deliver a seamless and efficient electric cab service experience leveraging blockchain technology.

Objectives and Goals

Project: Launching a private blockchain-based company Safari in India that onboards electric auto-rickshaw data on-chain and provides an electric cab service for customers.
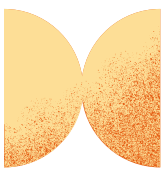
Goal # 1
Electric Auto Rickshaw Service for Customers
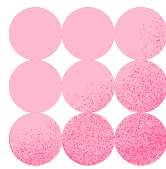
Goal # 2
Onboarding Electric Vehicles on the Chain
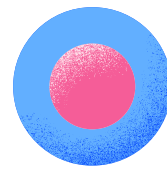
Goal # 3
A digital ledger system integrating all features

Goal # 1: Electric Auto Rickshaw Service for Customers

Specific:
-To provide an affordable and reliable electric auto-rickshaw service for customers in Hyderabad city.
-Achieve a minimum of 35,000 downloads in six months.
-To establish a fleet of 300 electric auto-rickshaws in the first six months of operation. Moving to a total of 700 vehicles during the first year of operation in all major hot-spots in Hyderabad main city.

Measurable:
-To achieve an average monthly revenue of INR 1,000,000 within the first year of operation.
-To maintain a customer satisfaction rating of at least 4 out of 5 stars on all major review platforms.

Achievable:
-To achieve a competitive pricing model by analyzing the market and identifying the needs of the target audience.
-To ensure the availability of the required number of electric auto-rickshaws by establishing partnerships with manufacturers and telecom providers.

Relevant:
-To promote sustainable transportation and contribute to the reduction of carbon emissions in Hyderabad city.
-To create job opportunities for local drivers.

Time-bound:
-To launch the electric auto-rickshaw service on August 1, 2023.
-To achieve the above-mentioned metrics within the first year of operation.

Goal # 2: Onboarding Electric Vehicles On The Chain

Specific:
-To onboard the data of at least 300 electric auto-rickshaws on-chain within the first 6 months of operation.
-To ensure the security and privacy of the data by implementing a robust encryption mechanism.

Measurable:
-To achieve an accuracy rate of at least 98% in recording and tracking the data of the electric auto-rickshaws on-chain.
-To maintain a high level of transparency in data management by providing real-time access to the data to all stakeholders.

Achievable:
-To establish partnerships with manufacturers and distributors of electric auto-rickshaws to facilitate the onboarding process.
-To conduct regular audits of the on-chain data to identify and resolve any discrepancies or issues.

Relevant:
-To promote the adoption of blockchain technology in the power and mobility sector to establish the company as a leader in the field.
-To ensure the security and privacy of the data of the electric auto-rickshaws and protect the interests of all stakeholders.

Goal # 3: A Digital Ledger System Integrating All The Features

Specific:
-Develop a digital ledger system integrating features for an electric vehicle cab service provider partnered with cab manufacturer, enabling private blockchain infrastructure.
-The system will incorporate identity passport management for cab drivers and real-time data access for the cab service provider and cab manufacturer through a dashboard platform interface.
-The system will also include a customer application and driver application for seamless cab service booking.

Measurable:
-Implement a private blockchain infrastructure that securely stores and manages cab driver identity passports, ensuring efficient verification and authentication processes.
-Enable real-time data access for the cab service provider and cab manufacturer, providing key metrics such as cab availability, usage patterns, and service performance for informed decision-making.

-Measure customer satisfaction and engagement through the customer application, tracking metrics like booking frequency, ratings, and feedback.

Achievable:
-Develop and deploy a private blockchain network using Hyperledger Fabric, providing a scalable and secure infrastructure for the digital ledger system.
-Integrate identity passport management features, ensuring seamless creation, validation, and updating of digital identity passports for cab drivers.
-Implement a robust dashboard platform interface that allows the cab service provider and cab manufacturer to access real-time data on cab and service performance.

Relevant:
-The integration of a digital ledger system addresses the need for transparency, efficiency, and data management in the electric vehicle cab service industry.
-It streamlines processes, enhances security, and enables data-driven decision-making for the cab service provider and cab manufacturer.
-The customer application improves user experience, providing convenient and reliable cab booking services.

Time-bound:
-Complete the development and deployment of the digital ledger system within a specific timeline, aiming for full functionality and integration within the target timeframe.
-Regularly assess and monitor progress to ensure adherence to project milestones and deadlines.
-Conduct periodic evaluations to measure the system's performance, customer satisfaction, and the achievement of key objectives.

Needs Statement

Electric Vehicle Manufacturer

By creating a model for the cab manufacturer to integrate smart energy devices and renewables and to validate the truth of energy data brings enormous amount of first-mover advantage within the collection and development of the most effiecient electric vehicles.

Blockchain utilization grants immutibility of the data of the vehicle lifecycle, truthful verification of identities, abilitiy to keep full record-keeping of each identity by creating a low-carbon, customer-centric electricity system by unleashing blockchain's potential.

This further helps the cab manufacturer pioneer as the largest IOT network containing data and information that can digitally track emissions through a supply chain on the energy chain to create flexibility ecosystem, reducing interoperability barriers and favouring thee use of standards in order to decarbonize Indian grids and put the end-user in the spotlight.
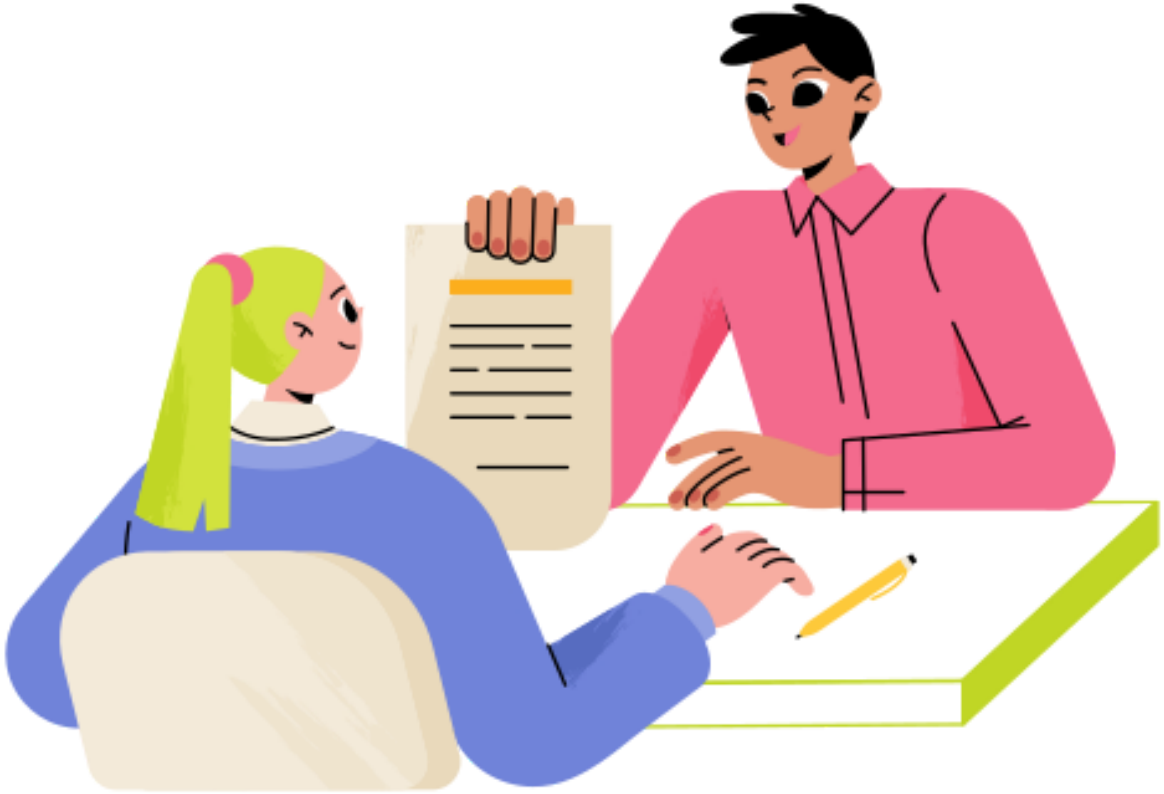
Cab manufacturer, as an electric vehicle manufacturer, recognizes the importance of providing sustainable and eco-friendly transportation solutions to the public. To continue this mission, there is a need to integrate an electric vehicle cab service provider with their cab vehicles. This integration will benefit Cab manufacturer in several ways.

There is a growing demand for electric vehicles in the market due to the government's push for electric mobility in India.
To capitalize on this demand, Cab manufacturer needs to maximize the potential of their electric cabs in the market.

The integration with an electric vehicle management system coupled with electric vehicle cab service will benefit Cab manufacturer in several ways:

1. Integrating an electric vehicle cab service provider with Cab manufacturer's auto rickshaw vehicles will create a new revenue stream for the company.

2. This integration will help Cab manufacturer to expand the market reach of their electric

vehicles and increase their market share.

3. It will also help to increase the utilization and revenue of Cab manufacturer's auto rickshaw vehicles.

4. The cab service provider will be able to offer electric vehicles to their customers, which will increase the demand for Cab manufacturer's auto rickshaw vehicles.

5. This integration will provide an opportunity for Cab manufacturer to showcase the reliability and durability of their electric vehicles in a commercial setting.

6. By partnering with an electric vehicle cab service provider, Cab manufacturer can offer a complete solution to customers, including charging infrastructure and maintenance services.

7. This integration will help Cab manufacturer to fulfill its commitment to environmental sustainability by reducing carbon emissions.

8. Cab manufacturer can also leverage data generated by the electric vehicle cab service provider to optimize their electric vehicles' performance and improve customer satisfaction.

Finally, this integration will help Cab manufacturer to establish itself as a leader in the electric vehicle market in India and pave the way for future growth.

As a leading electric vehicle manufacturer, Cab manufacturer needs to ensure that its electric vehicles are optimized for performance and efficiency. Real-time data on the performance of electric vehicles is crucial for Cab manufacturer to identify potential issues, optimize performance, and improve the overall driving experience for customers.

1. Integrating an electric vehicle cab service provider with Cab manufacturer's cab vehicles will provide an opportunity to collect metric and location data of their electric vehicles in real-time.

2. This integration will help Cab manufacturer to analyze the usage pattern of their electric cabs, including distance traveled, time taken, and charging patterns.

3. By leveraging the data collected by the cab service provider, Cab manufacturer can optimize the performance of their electric vehicles, reduce downtime, and improve overall efficiency.

4. The data collected by the cab service provider can also help Cab manufacturer to identify areas for improvement in their electric cabs, including battery life, charging infrastructure, and maintenance.

5. With access to real-time data on the location of their electric cabs, Cab manufacturer can optimize their vehicle routing and fleet management, resulting in reduced operational costs.

6. This integration will also help Cab manufacturer to better understand the customer requirements and preferences of electric vehicle cab services in the specific location where the cab service provider operates.

7. Based on the data collected by the cab service provider, Cab manufacturer can also identify the demand for electric vehicle cab services in other locations and potentially expand their operations.

Overall, The collection of real-time data on the performance of electric vehicles is crucial for Cab manufacturer to optimize vehicle performance, improve customer satisfaction, reduce costs, and ensure the reliability of their electric vehicle fleet.

Architechture

The platform can be designed with a modular architecture, where the core components such as the ledger, smart contract engine, and consensus mechanism are separated from the application logic. This will enable the platform to be more scalable, secure, and flexible. The ledger will store all the transaction data and will be replicated across all the peer nodes. The smart contract engine will execute the business logic specified in the smart contracts, and the consensus mechanism will ensure that all transactions are validated and agreed upon by the majority of the network participants.

In summary, the stakeholders in the Hyperledger Fabric network for a cab service platform where Safari is the mediator include Safari, cab manufacturer, customers, and cab drivers. The peers can be assigned to each stakeholder, and the consensus mechanism can be PBFT or Raft. The architecture of the platform can be modular, with separate core components for the ledger, smart contract engine, and consensus mechanism.

Consensus Mechanism

The best consensus algorithm to use in Hyperledger Fabric for a cab service electric vehicle platform would be **Practical Byzantine Fault Tolerance (PBFT)**. PBFT is a consensus

mechanism that is designed to provide high throughput and latency, while also being able to tolerate malicious actors. This makes it a great choice for a cab service electric vehicle platform, as it is designed to ensure a secure and reliable system, even in the presence of malicious actors. Additionally, this consensus algorithm is also highly scalable, which is important for a platform that is expected to handle a large number of transactions.

Endorsement Requirements

Instances where an endorsing peer is required and the actors required to endorse for customers riding the electric vehicle service:

1. **Driver Registration:** The cab service provider's administrators and verifying authorities, such as government agencies or regulatory bodies, act as endorsing peers to validate the driver's identity, license, and vehicle ownership information.
2. **Vehicle Registration:** When a new electric vehicle is added to the fleet, the vehicle registration process needs to be endorsed by relevant actors such as the cab service provider and the cab manufacturer. This ensures that the vehicle is officially recognized and authorized for operation.
3. **Ride Booking:** When a customer books a ride through the application, the endorsing peers can include the customer, the cab driver, and the cab service provider. Their endorsement confirms the details of the ride, such as the pickup location, destination, and fare estimation.
4. **Ride Completion:** After the completion of a ride, the customer, cab driver, and cab service provider can act as endorsing peers to endorse the details of the ride, including the actual duration, distance traveled, and the final fare charged.
5. **Payment Settlement:** The customer, cab driver, and the cab service provider may act as endorsing peers to endorse the payment details, including the mode of payment, transaction amount, and settlement process.
6. **Service Feedback and Ratings:** Customers can provide feedback and ratings for the cab driver's performance, and the endorsing peers can include the customer and the cab service provider. Their endorsement confirms the authenticity of the feedback and ratings.
7. **Dispute Resolution:** In case of any disputes between the customer and the cab driver, the endorsing peers can include representatives from the cab service provider, customer support, and relevant authorities. Their endorsement validates the resolution of the dispute and any adjustments made.

Project Scope

The project aims to develop a private blockchain-based software infrastructure that connects the electric vehicle cab service provider with a leading electric cab manufacturer in India, along with features and funcationalities of a digital passport

identities (DIP) of the electric vehicle drivers and electric vehicle cab service application.

The project scope is as follows:

1. Private Blockchain Infrastructure: Develop a private blockchain infrastructure that connects the cab drivers, Cab manufacturer manufacturing and Safari, allowing for secure and transparent data exchange.

2. Digital Identity Passport: Implement a digital identity passport for each cab driver in with respect to their electric vehicle on the blockchain network. The digital identity passport will contain information such as driver's license, vehicle registration, charging metric data, maintenance history etc. DIPs are like digital passports anchored on a blockchain. They allow the verification of claims from actors of the decentralized network. These claims can contain asset data, ownership relations or any other relevant information. Blockchain technology ensures that the information cannot be changed unilaterally, this means data cannot be tampered.

3. Digital Asset Broker technology: Implementing this feature with be a one solution stop for the hassle of finding the appropriate electric vehicle charging point and having difficulty making payments being time consuming and stressful.

4. Dashboard Platform Interface: Develop a dashboard platform interface for Mahindra and Safari to access real-time data on the cab drivers and their electric vehicles, including battery life, charging patterns, and vehicle usage. Essentially a front-facing interface for the companies to handle the electric vehicle life-cycle management.

5. Customer Application: Develop a customer application that allows users to book electric cab services provided by the cab service provider, Safari. The application will provide real-time tracking of the cab's location, estimated time of arrival, and fare estimates in accord to the mileage.

6. Smart Contracts: Develop smart contracts on the private blockchain network that govern the terms and conditions of the electric cab services provided by the cab service provider.

7. Testing and Deployment: Conduct rigorous testing to ensure the private blockchain network, digital identity passport, dashboard platform interface, and customer application are working as intended. Deploy the infrastructure in a live environment, integrating the private blockchain network with the electric cabs and Mahindra's data dashboard.

The project scope aims to create a secure, transparent, and efficient electric cab service infrastructure that benefits both the cab drivers and Mahindra. The private blockchain network will allow for secure and transparent data exchange between the cab drivers and Cab manufacturer, improving vehicle performance, fleet management, and customer experience. The digital identity passport and smart contracts will enhance the security and trust of the electric cab services, providing a better customer experience. The customer application will provide real-time tracking and fare estimates, improving the convenience and reliability of the electric cab services.

Project Scope - Smart Contracts

There are several types of smart contracts that can be implemented for the electric vehicle cab service provider on a private blockchain partnered with Cab Manufacturer on Hyperledger Fabric. Some of these include:

1. Ride Booking Contract: This smart contract would govern the terms and conditions of a ride booking between the customer and the cab service provider. It would include information such as the pickup location, destination, fare estimate, and payment terms.

2. Identity Verification Contract: This smart contract would ensure that each cab driver has a valid digital identity passport on the blockchain network, verifying their identity and vehicle ownership.

3. Maintenance Contract: This smart contract would ensure that each electric cab is regularly maintained and serviced. It would include information such as the maintenance schedule, repair history, and warranty terms.

4. Battery Charging Contract: This smart contract would ensure that each electric cab's battery is regularly charged and maintained. It would include information such as the charging schedule, battery health, and warranty terms.

5. Fleet Management Contract: This smart contract would govern the terms and conditions of the electric cab fleet management between the cab service provider and Mahindra. It would include information such as the number of cabs, vehicle registration, insurance, and maintenance responsibilities.

Overall, these smart contracts would help ensure that the electric cab service provider on Hyperledger Fabric partnered with Mahindra operates efficiently and effectively. They would enable secure and transparent data exchange between the cab drivers and Mahindra, providing real-time insights into vehicle performance, fleet management, and customer experience.

Let us take a closer look at the functioning of these smart contracts.

1 Ride Booking Contract

RIDE BOOKING SMART CONTRACT
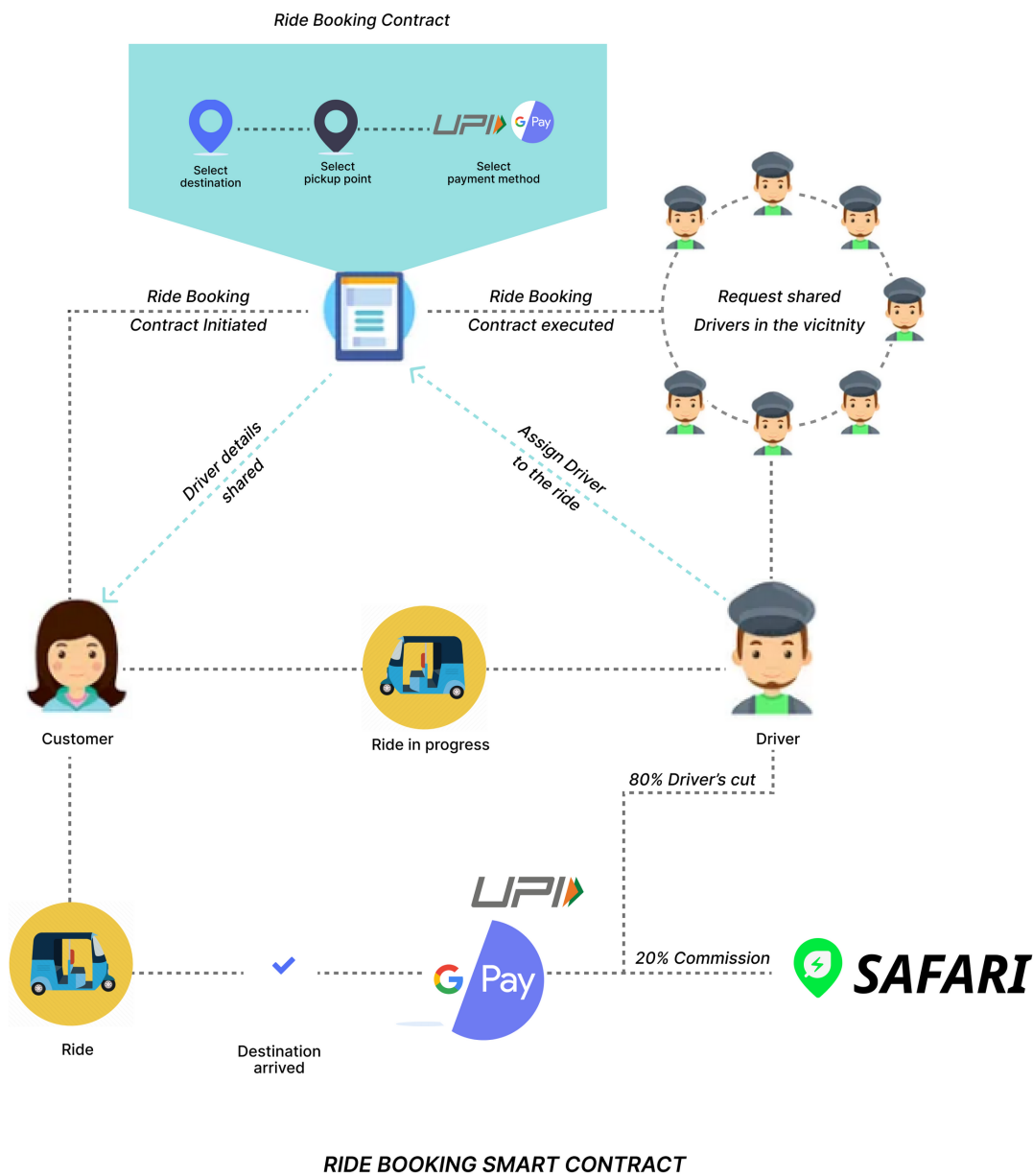
1. **Customer initiates a ride request**: The customer initiates a ride request through the cab service provider's mobile application. The app collects the necessary information, including pickup location, destination, and payment method.
2. **Ride booking contract executes:** The ride booking contract on the private blockchain network would be triggered once the customer initiates a ride request. The contract would automatically verify the customer's identity, calculate the fare estimate based on the distance between the pickup and drop-off locations, and generate a unique ride ID.
3. **Ride details shared with the driver:** The ride booking contract would automatically share the ride details with the available cab drivers within the vicinity of the pickup location.

The drivers would receive the ride request on their mobile application, along with the fare estimate and customer's pickup location.

4. **Driver accepts the ride:** The drivers can choose to accept or reject the ride request based on their availability and proximity to the customer's location. If a driver accepts the ride request, the ride booking contract would automatically assign the driver to the ride and notify the customer of the driver's details, including name, photo, and vehicle information.

5. **Ride in progress:** Once the driver arrives at the pickup location, the ride booking contract would automatically initiate the ride and start tracking the distance traveled and time taken. The customer and driver can view the ride progress in real-time on their mobile applications.

6. **Ride completed:** Once the ride is completed, the ride booking contract would automatically calculate the final fare based on the distance traveled and time taken. The payment would be deducted from the customer's preferred payment method, and the ride booking contract would update the driver's earnings and the cab service provider's revenue.

7. **Feedback and rating:** After the ride is completed, the customer and driver can provide feedback and rating for the ride, which would be recorded on the private blockchain network. This feedback would help improve the customer experience and driver performance in future rides.

Overall, the ride booking smart contract would enable secure and transparent booking, tracking, and payment processing for Safari on Hyperledger Fabric partnered with Mahindra. The automated execution of the contract would eliminate the need for intermediaries, reduce transaction costs, and increase efficiency and trust between the cab drivers, the cab service provider, and the customers.

#2 Maintainance Smart Contract

1. **Maintenance Schedule Creation:** The cab service provider Safari along with Mahindra will define a maintenance schedule for their electric vehicles based on factors such as mileage, time duration, or specific maintenance requirements. This schedule will be stored and managed within the smart contract.

2. **Maintenance Trigger:** When a specific maintenance event is due according to the schedule (e.g., reaching a certain mileage threshold), the smart contract will automatically trigger a maintenance request for the corresponding vehicle.

3. **Maintenance Provider Selection:** The smart contract will facilitate the selection of an authorized maintenance provider from a pre-approved list. The selection can be based on factors like availability, proximity, or service quality metrics.

4. **Maintenance Request and Approval**: The smart contract will generate a maintenance request, including details such as the vehicle identification, maintenance type, and required service. The request will be sent to the selected maintenance provider for review and approval.

5. **Service Execution:** Once the maintenance provider approves the request, they will perform the required service on the vehicle. The maintenance provider will update the smart contract with details of the service performed, including parts replaced, repairs made, and service completion timestamp.
6. **Payment Processing:** The smart contract will automatically calculate the service cost based on pre-agreed rates and deduct the payment from the cab service provider's digital wallet. The payment will be transferred to the maintenance provider upon successful completion of the service.
7. **Metrics and Reporting:** The smart contract will capture and record various metrics related to maintenance, such as the number of maintenance requests, response time of maintenance providers, service completion time, service quality ratings, and overall maintenance costs. These metrics can be analyzed and used for performance evaluation and decision-making.

Example Scenario:

- The smart contract triggers a maintenance request for an electric vehicle in Safari's fleet as it has reached a mileage threshold specified in the maintenance schedule.
- The smart contract selects an authorized maintenance provider based on their proximity to the vehicle's location and their historical performance in servicing electric vehicles.
- The maintenance provider approves the request and performs the required service, which includes battery inspection, tire rotation, and software update.
- The maintenance provider updates the smart contract with the details of the service performed, indicating the parts replaced, repairs made, and service completion timestamp.
- The smart contract calculates the service cost based on the agreed rates and initiates the payment from the cab service provider's digital wallet to the maintenance provider.
- The smart contract records the maintenance request, service details, payment transaction, and relevant metrics such as response time, service completion time, and service quality ratings.

  These metrics can be used by the cab service provider and Cab Manufacturer to analyze maintenance trends, identify potential issues, and optimize their maintenance operations for improved vehicle reliability and customer satisfaction.

#3 Battery Charging Smart Contract

1. **Charging Request:** The cab driver will request a charging session through the dashboard platform interface, specifying the time and location of the charging request.
2. **Availability Check**: The smart contract will check the availability of the charging station, based on the location and time requested by the cab driver.
3. **Charging Cost Calculation:** Once the availability of the charging station is confirmed, the smart contract will calculate the cost of the charging session based on the battery level of the cab and the electricity rates applicable at the charging station.

4. **Payment:** The cab driver will make the payment for the charging session using the cab service provider's digital wallet, which will be integrated with the smart contract.
5. **Charging Session:** The charging session will begin once the payment is confirmed and will be monitored by the smart contract to ensure that the charging station is providing the correct amount of electricity and that the cab is being charged correctly.
6. **Charging Completion:** Once the charging session is complete, the smart contract will update the cab driver's digital wallet with the charging cost and send a notification to the cab driver that the charging session is complete.
7. **Data Recording:** The smart contract will record all the charging session data, including the time and location of the charging request, the cost of the charging session, and the amount of electricity consumed by the cab.

Examples of metrics that can be tracked through the battery charging contract smart contract include the number of charging requests, the availability of the charging stations, the cost of the charging sessions, the amount of electricity consumed, and the average time taken for a charging session. These metrics can be used to optimize the charging infrastructure and improve the efficiency of the cab service.

#4 Fleet Management Smart Contract

The Fleet Management smart contract for the electric vehicle cab service provider partnered with Mahindra on a private blockchain infrastructure can be designed to work as follows:

1. Vehicle Registration: The cab service provider registers each electric cab on the blockchain by providing details such as vehicle identification number (VIN), registration number, and insurance information. This information is stored securely on the blockchain.

2. Ownership and Usage Rights: The smart contract defines the ownership and usage rights of each cab. It specifies that the cab service provider has the ownership rights, and the cab drivers have the right to use the vehicles for providing cab services within the defined scope.

3. Rental Agreement: The smart contract can include a rental agreement between the cab service provider and the cab drivers. It outlines the terms and conditions, such as the duration of the rental, rental fees, and payment terms.

4. Maintenance Responsibilities: The smart contract establishes the maintenance responsibilities between the cab service provider and the cab drivers. It can define that routine maintenance and repairs are the responsibility of the cab service provider, while the cab drivers are responsible for reporting any damages or issues promptly.

5. Mileage Tracking: The smart contract can include functionality to track the mileage of each

cab. It records the distance traveled by each vehicle, allowing the cab service provider to monitor the usage and plan maintenance activities based on the mileage.

6. Insurance Management: The smart contract can include insurance-related information, such as the policy details and coverage. It ensures that the vehicles are adequately insured, and any claims or incidents are handled in accordance with the agreed-upon terms.

7. Payment and Settlement: The smart contract can facilitate the payment and settlement process between the cab service provider and the cab drivers. It automates the calculation of rental fees based on the usage, records the payment transactions, and ensures timely and accurate settlement.

Examples and Usage Scenarios:

1. Rental Agreement Example: The smart contract generates a rental agreement between the cab service provider and a cab driver. It specifies that the cab driver will rent the electric cab for a month and pay a fixed rental fee. The agreement is stored on the blockchain for transparency and easy access.

2. Mileage Tracking Example: The smart contract records the mileage of each cab during a specific period. It generates a report showing the distance traveled by each vehicle, which helps the cab service provider identify high-usage cabs that may require maintenance or replacement parts.

Metrics and Reporting:

Metrics that can be tracked through the Fleet Management smart contract include the number of registered vehicles, rental fees collected, mileage per vehicle, maintenance costs, and revenue generated from the fleet. These metrics can provide insights into the performance of the fleet, utilization rates, profitability, and overall operational efficiency.

They can be analyzed to optimize fleet management strategies and improve decision-making for the cab service provider and Mahindra.

#5 Digital Identity Passport Smart Contract

The Identity Verification smart contract is designed to ensure that each cab driver has a valid digital identity passport on the blockchain network, verifying their identity and vehicle ownership.

Here are the step-by-step features of this smart contract:

1. Digital Identity Creation: The cab service provider initiates the process of creating a digital

identity passport for a cab driver. The driver provides their personal information, such as name, contact details, driving license, and vehicle registration details.

2. Verification Process: The smart contract initiates a verification process to validate the provided information. This process can involve checking the authenticity of the driver's license, validating vehicle ownership, and conducting background checks as required by local regulations.

3. Passport Issuance: Once the verification process is successfully completed, the smart contract generates a digital identity passport for the cab driver. The passport includes verified information such as the driver's name, photo, license details, and vehicle registration details.

4. Multiple Drivers for One Vehicle: The smart contract allows for multiple drivers to be associated with a single vehicle. This can be useful when there are shift-based operations or when drivers switch between different vehicles within the fleet. The passport will indicate the authorized drivers for each specific vehicle.

5. Driver Departure and Passport Expiration: In scenarios where a driver leaves the organization, their digital identity passport can become invalid. The smart contract can automatically mark the passport as expired and update the associated vehicle's passport to reflect the removal of the driver.

6. New Driver Assignment: When a new driver is assigned to a vehicle, the cab service provider initiates a new digital identity creation process for the driver. The smart contract verifies the new driver's information, issues a new digital identity passport, and associates it with the relevant vehicle.

7. Metrics and Dashboard Display: The smart contract records important metrics related to the digital identity passports, such as the number of active passports, passport expiration dates, and driver assignments. These metrics can be accessed and displayed on the dashboard platform interface. The dashboard can provide an overview of the current active drivers, their assigned vehicles, and any upcoming passport expirations. This information helps the cab service provider manage driver and vehicle assignments efficiently.

Managing Identities on the Blockchain:

To minimize data storage costs on the blockchain, sensitive personal information can be stored off-chain while maintaining the necessary reference and proof hashes on the blockchain. This approach allows for efficient verification and validation without exposing

sensitive data to the public blockchain. Only the necessary metadata and proofs of verification are stored on the blockchain, ensuring privacy and reducing storage expenses.

The cab service provider can implement a secure and encrypted centralized database or off-chain storage solution to store the sensitive personal information, maintaining the data integrity and accessibility required for identity verification. The smart contract on the blockchain can then reference the off-chain data using cryptographic hashes or reference identifiers, ensuring the validity and integrity of the stored data.
By leveraging off-chain storage for personal data and minimizing on-chain data storage to essential information, the cab service provider can effectively manage the identities on the blockchain while minimizing costs associated with data storage on-chain.

Project Scope - Digital Asset Broker Technology

DAB connects our Internet of Things network with blockchain technology, enabling devices and car and charging point to securely trade with each other, all without human intervention, but your full control.

Working of DAB

- DAB assigns each electric vehicle with a digital identity passport and matches this with the authorized driver.
- As the vehicle is plugged into the charging point, DAB establishes a secure connection. This confirms the identity of the vehicle and the charging point.
- It then manages the payment through a secure SIM digital walletand takes care of the payment automatically.
- Multiple people can be authorized to use a particular vehicle and its payment credentials.

Telecom runs the world's largest IOT network and with the number of connected devices world wide expected to be in the billions by 2025, we must get ready for the next big global trend, the economy of things.

A world where machines and devices trade on your behalf, but securely and with you in control.

Business Requirements

#1 Functionalities

1. Cab Driver Identity Management: The system should provide a secure and efficient way to manage the identity of cab drivers. This includes creating and verifying digital identity passports for drivers, validating their licenses, and associating drivers with specific vehicles.

2. Private Blockchain Infrastructure: The software infrastructure should be built on Hyperledger Fabric, providing a private blockchain network for data storage and transaction processing. This ensures secure and permissioned access to sensitive cab and service-related data.

3. Cab Data and Service Management: The system should allow the cab service provider and Mahindra to access and manage data related to cabs and cab services. This includes information about vehicle registration, insurance, maintenance records, and other relevant details.

4. Dashboard Platform Interface: A dashboard platform interface should be developed to provide a user-friendly interface for the cab service provider and Mahindra to monitor and analyze cab data. The dashboard should display key metrics, such as cab utilization, driver assignments, and maintenance schedules.

5. Customer Application: A customer-facing application should be developed to enable customers to book cab services. The application should provide features such as real-time cab availability, fare calculation, and secure payment options.

6. Driver application with integrated DAB system: A driver-facing application should be developed to enable drivers to track and manage their vehicles in terms of the charging, nearest charging point, booking vicinity, mapping, fair calculation, payment gateways etc.

#2 Technical Requirements

1. Hyperledger Fabric Implementation: The system should be built on Hyperledger Fabric, utilizing its features such as permissioned access, consensus mechanisms, and smart contracts for secure and efficient data management.

2. Identity Passport Creation and Verification: The system should provide a streamlined process to create digital identity passports for cab drivers and verify their information through appropriate validation mechanisms.

3. Integration with Vehicle Data Sources: The system should integrate with vehicle data sources, such as onboard sensors and tracking devices, to collect real-time data about the cabs, including location, mileage, and condition.

4. Encryption and Privacy: Sensitive personal data should be encrypted to ensure privacy and comply with data protection regulations. Access controls and encryption techniques

should be implemented to safeguard data integrity and confidentiality.

5 Scalability and Performance: The system should be designed to handle a large number of cab drivers, vehicles, and customer bookings. It should be scalable to accommodate future growth and should provide high performance to handle real-time data processing and transaction throughput.

6. API Integration: The system should support integration with external systems, such as payment gateways and mapping services, to enable seamless customer experiences and facilitate secure and efficient transactions.

7. Data Backup and Recovery: Mechanisms should be in place to ensure regular data backups and facilitate disaster recovery in case of system failures or data loss.

By meeting these business and technical requirements, Safari and Mahindra can effectively manage cab operations, ensure data security and privacy, and provide an enhanced customer experience through the integration of a private blockchain infrastructure and associated applications.

Revenue Opportunity - Drivers

95,000.00
savings per year

85% less
Fuel price

2 times
Earnings per day
From 700Rs to 1500Rs

Before transitioning to the electric vehicle cab service provider platform from Ola, drivers had the following revenue opportunities:

Before:

1. Earned money based on the number of rides completed and fares earned from passengers.
2. Faced competition and fluctuating ride demand, impacting their earnings.
3. Ola took a commission from their fares, about 15% to 40%.
4. Operating expenses included fuel costs (petrol/diesel) and maintenance.

Parameter	Fuel Auto-Rickshaws	Electric Auto-Rickshaws
Operational Cost	High and uncertain	Low and Certain
Price / km	4 Rs / km	0.10 Rs / km
Total spend on fuel	Mini. 6000 Rs	Max 1200 Rs
Maintainance Cost	3000 Rs / 2 months	Negligible
Fuel Range	200 Km	140 Km
Full Capacity Price	109 Rs / L = 872 Rs	40 Rs
Capacity	8 L	7.37 kw
Top Speed	50-60 Kmh	55 Kmh

After transitioning to the electric vehicle cab service provider platform, drivers experience the following revenue opportunities:

After:

1. Increased earning potential due to lower operating costs of electric vehicles compared to petrol/diesel vehicles.
2. Savings on petrol/diesel expenses contribute to higher overall earnings.
3. Access to incentives from the government for going green and using electric vehicles, such as subsidies, tax benefits, and grants.
4. Partnership with cab manufacturer may offer additional incentives and rewards for driver performance, customer ratings, and participation in eco-friendly programs.
5. Real-time data and analytics through the dashboard platform interface enable drivers to optimize their earnings by efficiently serving customers and identifying demand patterns.
6. Enhanced customer application for booking cab services expands their customer base and potential earnings.

In summary, the transition to the electric vehicle cab service provider platform offers drivers increased earning potential through lower operating costs, incentives from the government for going green, and additional rewards and optimizations provided by the platform and partnership with cab manufacturer.

Target Audience

Target Audience #1
Financially Independant
individuals - Daily commuters

Target Audience #2
Office goers

Target Audience #3
College students

Target Audience #4
Ola age group

Competition

Both **Ola and Uber** have remarkably transformed India's ride-hailing sector and have revolutionized how individuals travel in metropolitan regions. Although both corporations possess their advantages and drawbacks, they have successfully acquired a substantial portion of the market by introducing inventive solutions and maintaining competitive pricing.

OLA	**Uber**
Leading ride-hailing service with extensive reach. Largest and India & high global rank.	Global giant having first mover advantage.
Rapido	**inDrive**
Quick motorcycle-based rides at affordable prices, grabbed a niche market.	Affordable and reliable local ride-hailing, quickly growing.

Rapido
13%

inDrive
3%

Ola
51%

Uber
33%
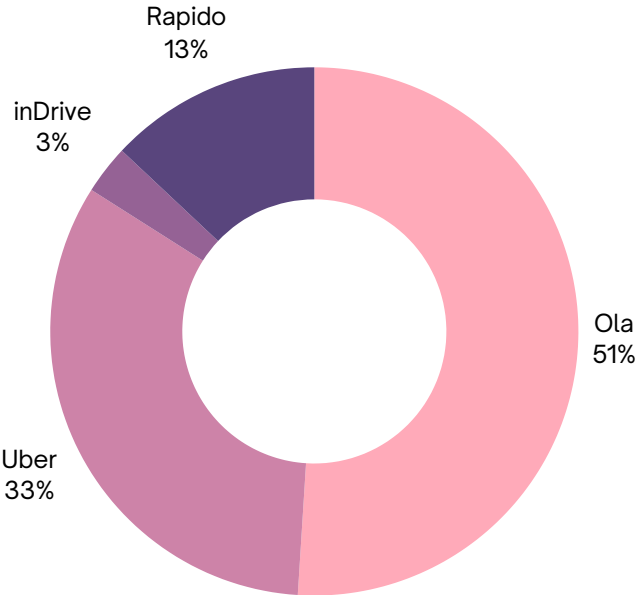
Ola's back will break: A perfect entry

It is difficult to ignore that something is wrong with the company, when you are late for the office and 3 drivers cancel your ride! Or when you see burning vehicles all over the news and are terrified to buy one! So let's see what is happening with it.

The first phase is cash drain. This is where a company spends a ton of

money to acquire the stakeholders. In case of Ola they gave us insane discounts and ultra cheap rights to tempt us to download the app and the drivers were given very very lucrative incentives because of which both customers and drivers were super happy.

So in this ways we got cheap rights at our doorstep and the drivers made 70 to 80,000 Rs per month driving Ola cabs.

And this is where the second phase comes in which is trust building.

Now you see if you are a blue collar worker making 300000 Rs.

Per month and you see your cab driver friend making eighty thpusand Rs per month by working for the exact same hours.

What would you do? You would also become a cab driver, right? Well, here's where. Because of the trust that Ola had built with the drivers,

people in the lower economic strata actually started leaving their job, applied for loans, and bought a car just to become an Ola Uber driver.

Similarly, from the customer standpoint, we all got habituated with Ola and Uber, and as more and more people, both from the side of customers and drivers,

started using Ola, the company started growing massively.

But at the same time with each passing quarter they were incurring hundreds of crores of losses.

Now use where the third phase came in which is dependency. Suppose if you being a blue collar worker after leaving your job. Once you buy a car on an EMI you are stuck with the cab business for five years until you pay off your loan. Similarly from the customers end we started getting reimbursements.

Some of us even left the thought of owning a car. We bought an Ola pass, used Ola share and made Ola an important part of our lifestyle.

This is when many

conventional cap services went out of the business as the Indian market started pivoting towards Ola and Uber.

OLA Electric: Let's start with its newbie business, **Ola electric, New-gen**, Classy are the words people used to describe its vehicle when the company revealed it for the first time. It was actually the first time in India,

when people were excited about an EV, the excitement was so much that the company bragged about selling more than 1,00,000 scooters on day 1 itself, which amounts to sales of more than 1100 crores.

Quite a feat to achieve, even when you don't have a product ready.

The company promised to deliver the scooters in just a month, and then we all know what happened, they failed to deliver on the promise and kept pushing their deliveries month on month.

The company blamed it on the semiconductor chip shortage, but the question is if the production wasn't in place, why make the promises of delivering the vehicle in a month?

The customers were pissed with the delay in delivery and even after they managed to deliver the scooters two months later, there were a ton of complaints across Twitter that said the scooters were faulty.

They were faulty to the extent that a small bug in their software caused a major accident of a 65-year-old.

Faulty, Dangerous are the adjectives people now use to describe the vehicles. Okay, they are new to this, maybe the management is trying to learn how to operate like an automobile company

Perhaps we could invert this, by being a manufacturing company who is an expert with their vehicles to operating on the customer cab service end.

Impact of Covid 19

(Rs crore) ■ Revenue from operations ■ Net loss

FY	Revenue from operations	Net loss
FY17	1,178	4,898
FY18	1,847	2,842
FY19	2,544	2,593
FY20	2,665	2,208
FY21	983	1,116
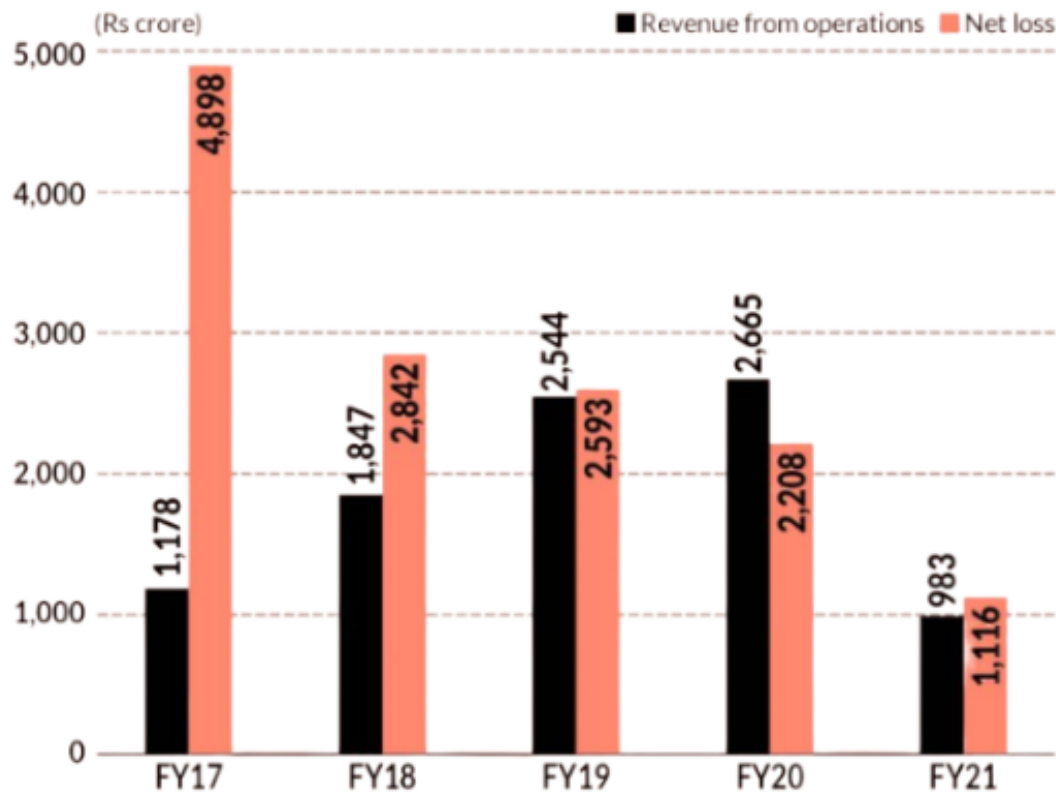
OLA Cabs: The pandemic was the toughest time for all cab companies across the world, even then Ola decided to focus on the EV segment and let the company operate on autopilot, and guess what happened, many drivers left the company, and the number of cabs on the roads decreased.

In 2017-18, many people joined Ola and Uber as drivers as the incentives were quite high, people even left their stable jobs to work for them, but the pandemic struck and the situation of these drivers was grim, they had to pay hospital bills, have to keep up with the expenses even when there were no rides during the lockdown, Ola failed to provide them any stable income and they were forced to leave the cities and work in their hometowns, as a result now we have much fewer cabs on the roads.

Ola to lay off about 1,400 employees, nearly 25% of its total workforce, amid pandemic

The shortage of cabs has led to skyrocketing fares now, due to which people are now looking at hope with rickshawala.

- After buying a Car on EMI
- You're stuck with CAB business for 5 years
  - Until you pay back the loans

It wasn't just a pandemic that has hit O**la cabs**, even the company has reduced the incentives that they provide to the drivers to improve margins, but there is very less left for the drivers and due to that many of them have left the company.

LARGE LAYOFFS AT OLA
Sources Say

○ Ola says revenues ▼ 95% over last 2 months

ive

Ola To Lay Off Nearly 1,400 Employees,
Nearly 25% Of Its Total Workforce

As per the sources, Ola's calculation and revenue sharing with the drivers is vague, which is not the case with Uber. All these things impacted its top line, as it fell by more than 60% in FY21.

Ola, Uber driver pay cut by a third, incentives drop 60% says report

OLA

Mobility ⊙ OLA	**Financial services** Ⓜ	**Pre-owned cars** OLA CARS
Food OLA foods	**Electric vehicles (scooters)** OLA ELECTRIC	**Grocery delivery**
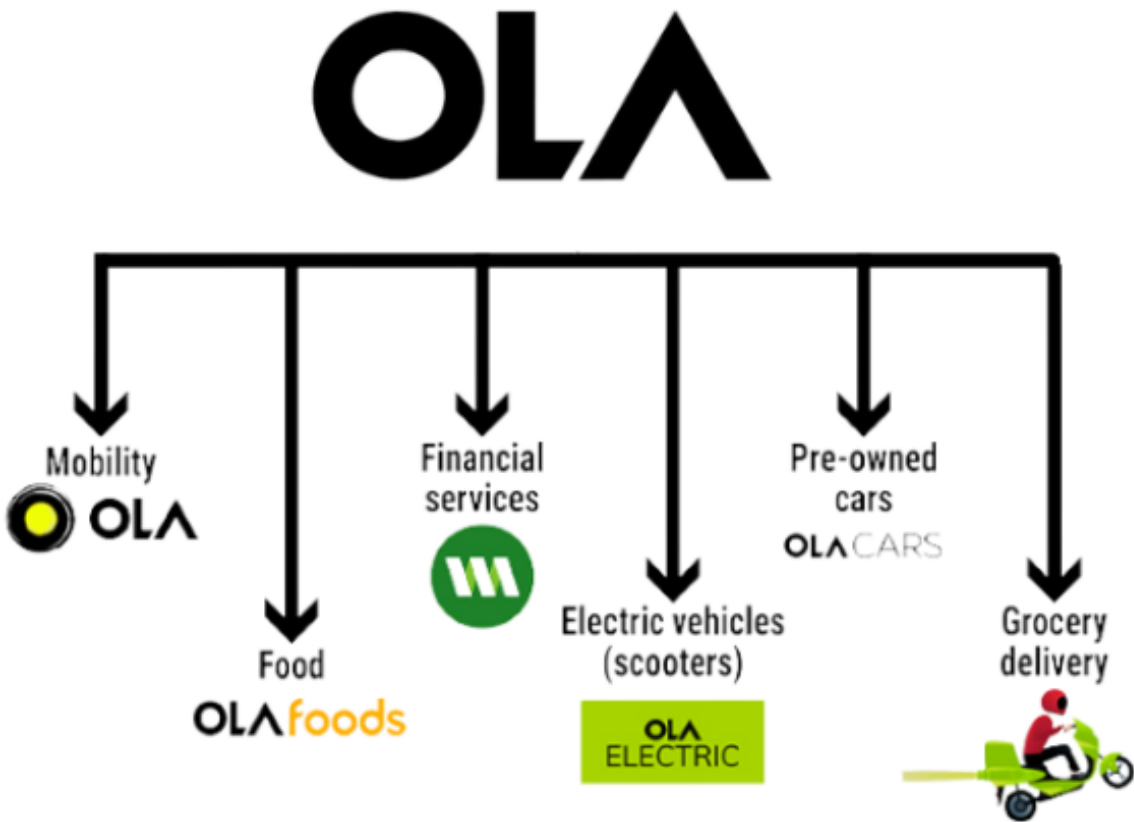
OLA Ventures: In 2015, the company launched **Ola cafe** which was shut down after a year or so, in 2017 it acquired 95% stake in Foodpanda for Rs. 200 crore, it further invested Rs. 1200 crore in it, further Foodpanda bought Holachef, In 2019 both companies were shut down.

In Dec 2021, when everyone was going gaga over the grocery delivery business, it also joined the bandwagon and launched Ola dash, the company soon realized its not as easy as they thought and decided to scale it down and fired over 2000 people.

Then we have its Ola cars, the platform for buying and selling used cars. The company tried to promote it aggressively but it seems like it is going nowhere as customers complained of high prices, low quality cards and other issues. Recently they have planned to shut down their business in some cities.

Ola's losses accumulate to Rs 17,453 Cr

as revenue shrinks 63% in FY21

OLA Financial Services: OFS has launched a slew of products and capabilities in both the lending and insurance businesses, including Ola Money, OlaMoney Postpaid, and OlaMoney Credit cards, and has partnered with leading merchants in the ecosystem.

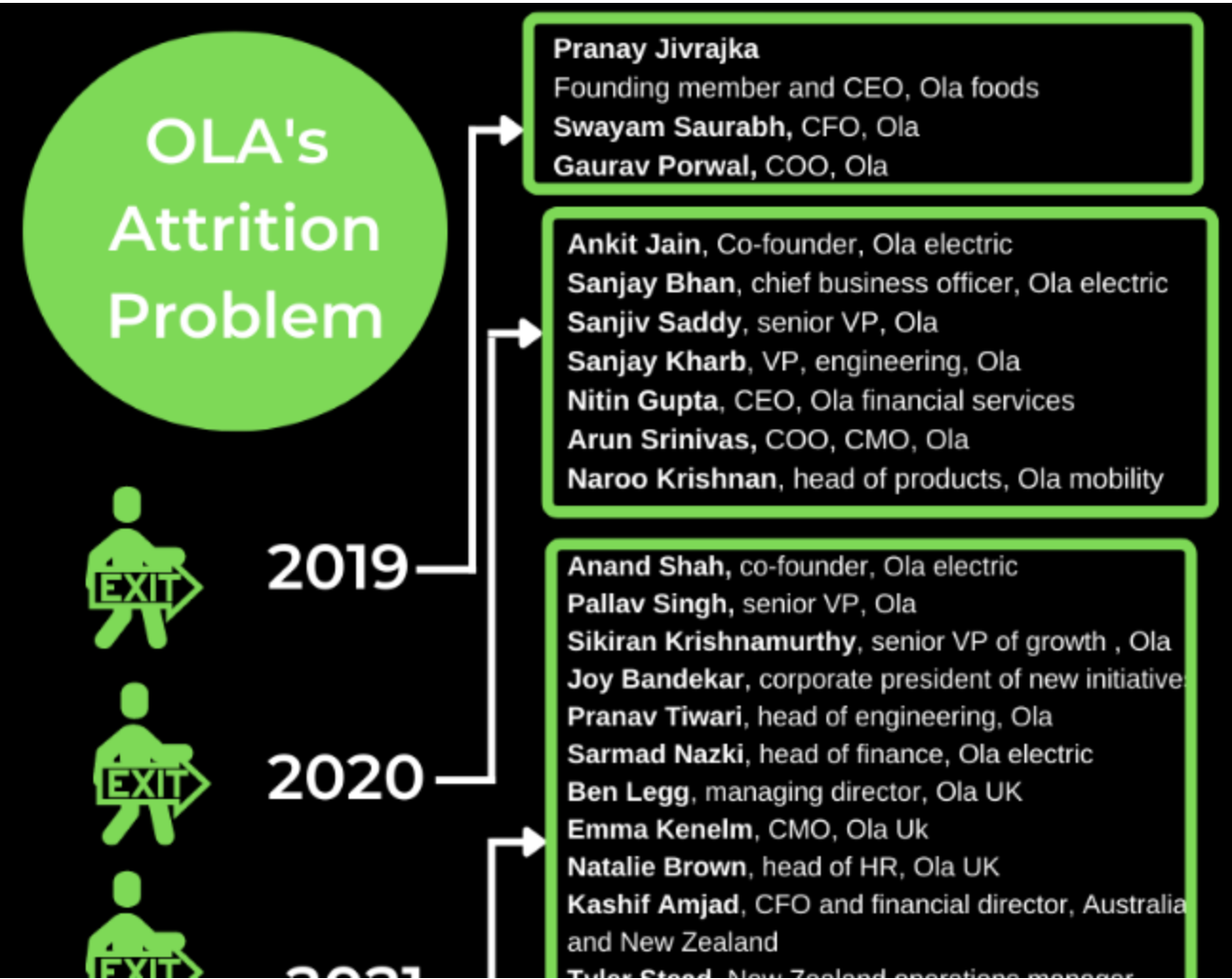It is looking to expand its suite of products by launching new lending offerings in the form of two-wheeler, four-wheeler, and personal loans to offer a comprehensive financial product ecosystem to the customer, as per the filing.

In March 2022, the company announced plans to acquire Avail Finance, a neobank that provides financial services to the blue-collared workforce and has over six million users, to have a broader push into the fintech space and build a mobility-focused financial service business. The company said partnership will enable it to cross-sell multiple lending products to its large driver-partner base.

How would this be successful with the massive distrust from especially the drivers, let alone the customers.

OLA Employees: the attrition in the top management of the company says it all. Multiple senior executives have left the company

OLA's Attrition Problem

Pranay Jivrajka
Founding member and CEO, Ola foods
Swayam Saurabh, CFO, Ola
Gaurav Porwal, COO, Ola

Ankit Jain, Co-founder, Ola electric
Sanjay Bhan, chief business officer, Ola electric
Sanjiv Saddy, senior VP, Ola
Sanjay Kharb, VP, engineering, Ola
Nitin Gupta, CEO, Ola financial services
Arun Srinivas, COO, CMO, Ola
Naroo Krishnan, head of products, Ola mobility

2019

Anand Shah, co-founder, Ola electric
Pallav Singh, senior VP, Ola
Sikiran Krishnamurthy, senior VP of growth , Ola
Joy Bandekar, corporate president of new initiative
Pranav Tiwari, head of engineering, Ola
Sarmad Nazki, head of finance, Ola electric
Ben Legg, managing director, Ola UK
Emma Kenelm, CMO, Ola Uk
Natalie Brown, head of HR, Ola UK
Kashif Amjad, CFO and financial director, Australia and New Zealand

2020

Recent exits from the company are of its Ola vehicle commerce CEO, Arun Sirdeshmukh and its chief of group strategy Amit Anchal.

As per reports, Arun managed the leading **Ola's electric division** and amidst the complaints of faulty scooters, and pressure of delivering them on schedule he decided to leave the company. Company's CFO has now taken over the role and would manage day to day operations, but is it possible for a person to manage the finances and lead an EV company?

How is SAFARI different from OLA

Aspect	*SAFARI*	OLA
Service Type	Electric Auto-Rickshaw Ride-hailing and courier service with Blockchain and IOT vehicle management dashboard	Ride-hailing and taxi service along with electric bike manufacturing
Vehicle Type	All Electric : Auto-Rickshaw & Bike	All Gas-fueled based engine
Environment	Eco-friendly	un-green, Damaging
Brand Image	The brand image is eco-friendly, comfort, safety, affordability and availability	The brand is often associated with convenience, affordability, and accessibility.
Maintainance	Monitored and Recorded, Regular Maintainance	Not Monitored and Recorded
Maintainance Warranty	Provided	Not provided
Maintainance Charges	Comparatively Negligible	Avg 3500 Rs / Month
Drivers Non-Monetary Benefits	Free Chai Every Day, Physical health campaigns	None
Drivers Monetary Benefits	Bonuses on weekly target completion	No more incentive or bonus provided
Battery Warranty	Provided	Not provided
Charging	Battery Swapping System at Stations	Self-service
Driver Earnings	16Rs/Km	12Rs/Km

Driver Savings	95,000Rs PA	None
Driver spending on fuel	Max 1,200Rs / Month	Avg 7,000rs / Month
Hospitality	Refreshments	None
Pricing	Transparent Pricing by KM/Hr	No Transparent pricing by KM/Hr
Engagement	Gamification	No Gamification
Customer Discounts	Scratch Cards and Bonus levels	No scratch cards
Driver Fund Initiative	Chidlren's Education Fund	None
Courier Services	Yes	No
Safari's Commission	20% FIXED commission	20-45% commission

Stakeholders

	Internal Stakeholder	External Stakeholder	Priority Stakeholder
Electric Vehicle Cab Service Provider		+	✔
Electric Cab Manufacturer			✔
Cab Drivers	+	✔	
Customers		✔	
Blockchain Dashboard Platform Developers	✔		
Customer & Driver App Developers	✔		
Compliance And			

| Regulatory Authorities | | ✔ | |

1. Electric Vehicle Cab Service Provider: Responsible for managing the overall cab service operations, including driver management, cab maintenance, and customer satisfaction. Their role involves coordinating with Electric Cab Manufacturer, ensuring compliance with regulations, and optimizing the utilization of the cab fleet.

2. Electric Cab Manufacturer: Provides the electric cabs to the cab service provider and partners with them to implement the private blockchain infrastructure. Electric Cab Manufacturer's role includes collaborating on the development of smart contracts, providing technical expertise, and ensuring the seamless integration of their electric cabs with the cab service provider's operations.

3. Cab Drivers: As key users of the system, the cab drivers are responsible for maintaining their digital identity passports, adhering to the rules and regulations set by the cab service provider, and using the dashboard platform interface for reporting their vehicle and trip-related information.

4. Customers: Utilize the customer application to book cab services, track their rides, and make payments. Their expectations are for a user-friendly and reliable application that provides real-time cab availability, accurate fare calculation, and secure transactions.

5. Blockchain Developers: Responsible for designing and developing the private blockchain infrastructure on Hyperledger Fabric, including the smart contracts and integration with Electric Cab Manufacturer's existing systems. Their role includes ensuring data security, scalability, and performance of the blockchain network.

6. Dashboard Platform Developers: Develop the dashboard platform interface used by the cab service provider and Electric Cab Manufacturer to access and analyze cab and service-related data. Their responsibilities include designing an intuitive user interface, integrating with data sources, and providing real-time analytics and reporting capabilities.

7. Compliance and Regulatory Authorities: Monitor and enforce compliance with regulations related to cab services, data privacy, and driver licensing. The stakeholders are expected to adhere to the guidelines and requirements set by these authorities.
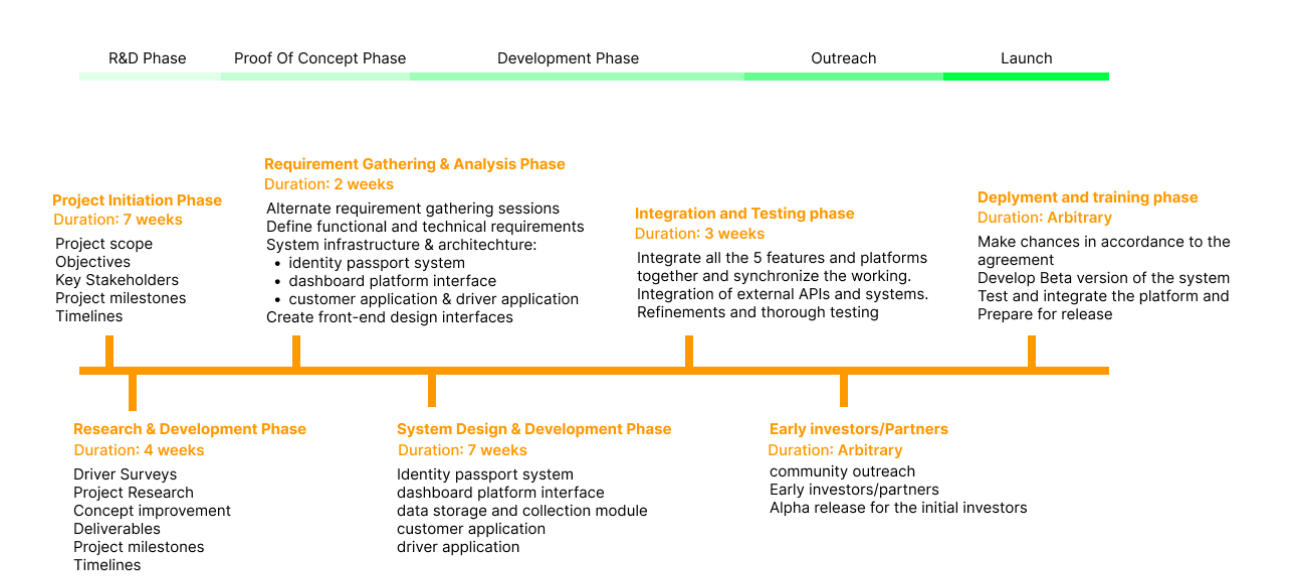
Additional Resources:

Depending on the scope and scale of the project, the business may need to hire additional resources such as:

1. Blockchain Architects and Developers: To ensure the successful implementation and maintenance of the private blockchain infrastructure, the business may need to hire experienced blockchain professionals with expertise in Hyperledger Fabric and smart contract development.

2. Application Developers: If the customer application requires advanced features and customization, hiring application developers with experience in mobile app development can be beneficial.

3. Data Security and Privacy Experts: As data security and privacy are crucial aspects of the project, hiring experts in this field can help ensure compliance with regulations and protect sensitive customer and driver information.

4. Project Manager: The business may need to assign a dedicated project manager to oversee the project's implementation, coordinate between stakeholders, manage timelines and budgets, and ensure successful delivery.

The specific resource requirements will depend on the project's complexity, timelines, and the existing skill set within the organization. Hiring additional resources will be based on the need for specialized expertise and the availability of in-house capabilities.

Timelines and Milestones

R&D Phase	Proof Of Concept Phase	Development Phase	Outreach	Launch

Project Initiation Phase
Duration: 7 weeks

Project scope
Objectives
Key Stakeholders
Project milestones
Timelines

Requirement Gathering & Analysis Phase
Duration: 2 weeks

Alternate requirement gathering sessions
Define functional and technical requirements
System infrastructure & architechture:
- identity passport system
- dashboard platform interface
- customer application & driver application
Create front-end design interfaces

Integration and Testing phase
Duration: 3 weeks

Integrate all the 5 features and platforms together and synchronize the working.
Integration of external APIs and systems.
Refinements and thorough testing

Deplyment and training phase
Duration: Arbitrary

Make chances in accordance to the agreement
Develop Beta version of the system
Test and integrate the platform and Prepare for release

Research & Development Phase
Duration: 4 weeks

Driver Surveys
Project Research
Concept improvement
Deliverables
Project milestones
Timelines

System Design & Development Phase
Duration: 7 weeks

Identity passport system
dashboard platform interface
data storage and collection module
customer application
driver application

Early investors/Partners
Duration: Arbitrary

community outreach
Early investors/partners
Alpha release for the initial investors

Timeline And Milestones

1. **Project Initiation Phase (Duration: 1 weeks)**
   ✔ Define project scope, objectives, and deliverables.
   ✔ Identify key stakeholders and their roles.
   ✔ Conduct initial feasibility study and risk assessment.
   ✔ Set project milestones and timelines.
   ✔ Establish project governance and communication protocols.
2. **Requirements Gathering and Analysis Phase (Duration: 2 weeks)**
   ✔ Conduct detailed requirements gathering sessions with the developers, CEO and CTO.
   ✔ Divide the work of each platform among the experts in the field.
   ✔ Analyze existing processes and systems to identify integration points and data dependencies.
   ✔ Define functional and technical requirements for the private blockchain infrastructure,
   ✔ identity passport system, dashboard platform interface, and customer application.
   ✔ Identify any regulatory or compliance requirements.
   ✔ Formulate a USP along with features of each application in a detailed format by preparing a product requirement folder along with front-end design interface for the products.
3. **System Design and Development Phase (Duration: 7 weeks)**
   ✔ Design the architecture of the private blockchain infrastructure, including the smart contracts and data schemas.
   ✔ Develop the identity passport system for cab drivers, including the process for creating, validating, and managing digital identity passports.
   ✔ Develop the dashboard platform interface for the cab service provider and Mahindra, integrating with data sources and providing real-time analytics.
   ✔ Develop the customer application for booking cab services, integrating with the private blockchain for real-time availability and fare calculation.
4. **Integration and Testing Phase (Duration: 2 weeks)**
   ✔ Integrate the private blockchain infrastructure, identity passport system, dashboard platform interface, and customer application.
   ✔ Conduct thorough testing of the entire system, including functionality, performance, and security testing.
   ✔ Validate integration with external systems, such as payment gateways and mapping services.
   ✔ Address any issues or bugs identified during testing and make necessary refinements.
   ✔ Valuation and mergers (Duration: Arbitratry)
5. **Deployment and Training Phase (Duration: 10 weeks)**
   ✔ Prepare the production environment for deployment.
   ✔ Migrate data from the existing systems to the private blockchain infrastructure.
   ✔ Conduct user training sessions for cab drivers, cab service provider staff, and Mahindra representatives on using the system and understanding their respective roles and responsibilities.
   ✔ Set up monitoring and support mechanisms for ongoing system maintenance.

Milestone Deadlines:

-Project Kickoff Meeting: **Week 1**
-Requirements Gathering and Analysis Document: **Week 6**
-System Design and Development Completion: **Week 16**
-Integration and Testing Completion: **Week 22**
-Deployment and Training Completion: **Week 24**

Dependencies and Unforeseen Challenges:

1. Dependencies: The project's success relies on close collaboration and timely input from the cab service provider, Mahindra, and other stakeholders. Integration with external systems, such as payment gateways and mapping services, may have dependencies on third-party providers and their APIs.

2. Unforeseen Challenges: Unforeseen challenges could include changes in regulatory requirements, technical complexities in integrating with legacy systems, and potential delays due to resource constraints or unforeseen technical issues. A contingency plan should be in place to address such challenges and minimize their impact on the project timeline. Regular communication and risk assessment throughout the project can help identify and mitigate potential challenges early on.