01

Fuel Station Payment

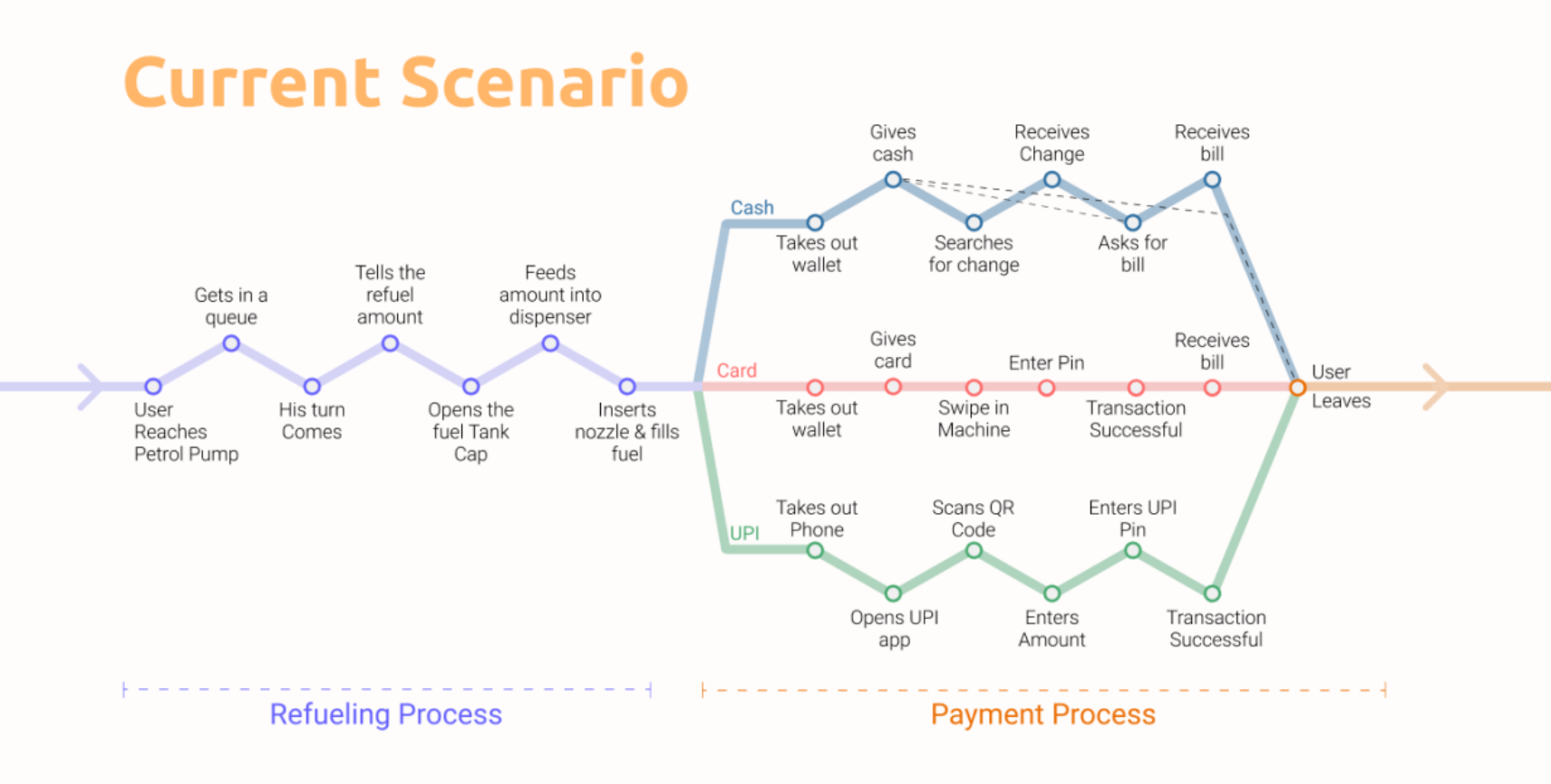
Project Brief

The payment process at fuel stations takes more time than actual refueling of the vehicle's fuel tank. Further, handling of cash physically, particularly during the COVID-19 pandemic is a big risk, since the currency notes cannot be sanitized regularly during every transaction. Hence, an alternative contact-less method is needed to both expedite the payment process and also to eliminate physical handling of cash.

Design Strategy

Understand the existing System → Define the System → Understand Opportunities → Ideate for Optimum Solution → Design Visuals

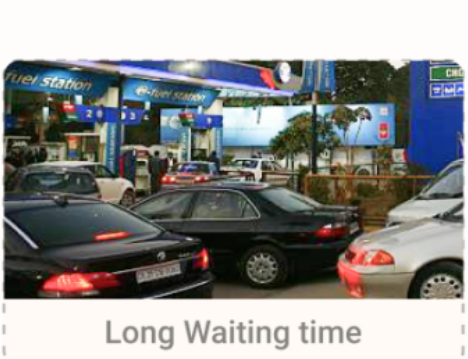
Current Scenario


User Reaches Petrol Pump
Gets in a queue
His turn Comes
Tells the refuel amount
Opens the fuel Tank Cap
Feeds amount into dispenser
Inserts nozzle & fills fuel
Cash
Takes out wallet
Gives cash
Searches for change
Receives Change
Asks for bill
Receives bill
Card
Takes out wallet
Gives card
Swipe in Machine
Enter Pin
Transaction Successful
Receives bill
UPI
Takes out Phone
Opens UPI app
Scans QR Code
Enters Amount
Enters UPI Pin
Transaction Successful
User Leaves
Refueling Process
Payment Process

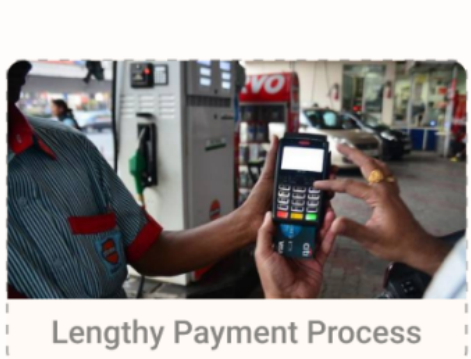
Research

Observations

Over-Crowded Fuel Stations



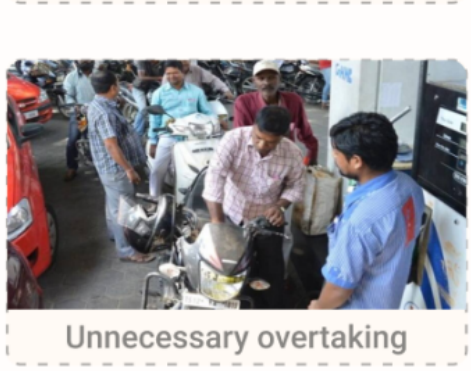
Long Waiting time



Lengthy Payment Process

Increased Carbon Emissions

Chaotic Operation



Unnecessary overtaking

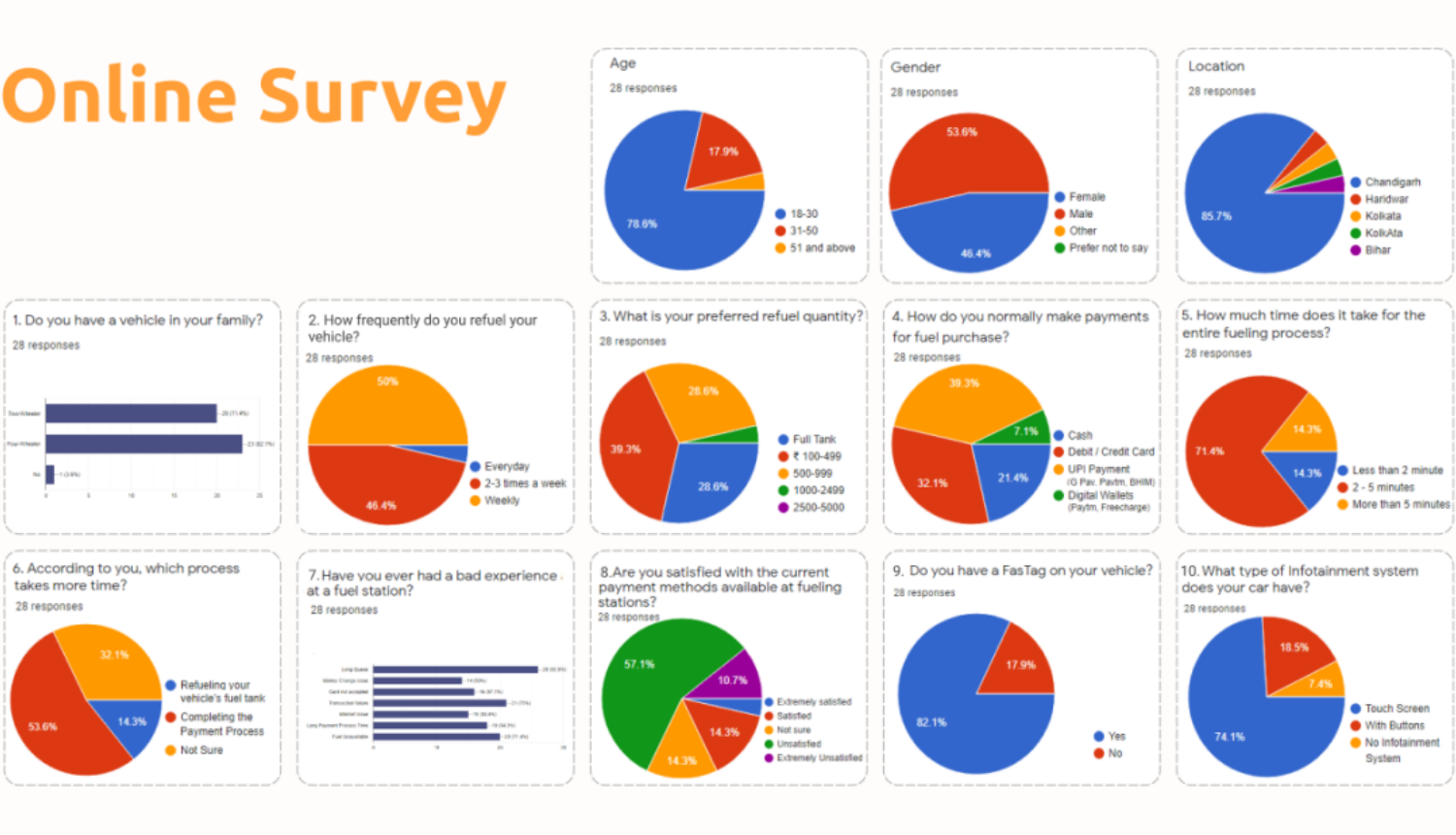
Field Survey Report

Mode of Payment	No. of Customers	Two Wheeler (₹ 100)			Four Wheeler (₹ 500)		
		Refill Time	Payment Time	Total Time	Refill Time	Payment Time	Total Time
Cash	25	30 s	60 s	90 s	45 s	60 s	105 s
Card	25	30 s	90 s	120 s	45 s	90 s	135 s
UPI	25	30 s	120 s	150 s	45 s	120 s	165 s
Average Time		30 s	90 s	120 s	45 s	90 s	135 s

This is Average time calculated on the basis of on-site observations

Observing with a Stopwatch to record time

Online Survey



Problem Statement

The current payment process at fuel station is both time consuming and involves the risks attached with physical exchange of paper / plastic currency.

User Insights

To understand the situation, we conducted personal interviews on users which allowed us to gain deep understanding about:

- The time they spend for refueling their vehicle
- The difficulties they face
- The bad experiences they have had
- The chaotic situations they have to deal with

Interviews revealed the following:

- They have to wait for long duration in queues for their turn
- They have to search and take out their wallets for cash / card payments; or their mobile phones for UPI or digital wallet payments
- The staff does not always carry cash / card machines / QR codes with them which delays the payment process
- Payments through cards or UPI are not very smooth and transaction failure are very common. At times UPI payments get stuck in the processing phase and double payments were also observed.
- Most of the respondents were dissatisfied with the entire process since they were wasting a lot of their time unproductively.

User Persona

Rohit Arora
31 | Chandigarh

Bio

Rohit is a 31 years old guy who owns his own business. He owns a car that he drives. He does not likes to go to a fuel station all the time and so gets his car's tank full every time he goes there. He usually uses his card or G Pay to make payments.

Goals and Needs

- He wants the fuel stations to be not overcrowded.
- Wants multiple dispensers to avoid waiting time
- Evey time he is in the fuel station, people with two wheelers keep overtaking for faster service. He wants this to stop.
- He wants a payment method that would be fast, contact-less, and reliable

Difficulties

- Transactions have been declined or stuck during processing at times. He had to make double payments and return again for refund
- The whole operation at the fuel station is too chaotic & not managed properly
- No seperate dedicated lanes for different categories of vehicles, leading to unnecessary arguments and delay.

Fastag on Vehicle

- Yes

Personality

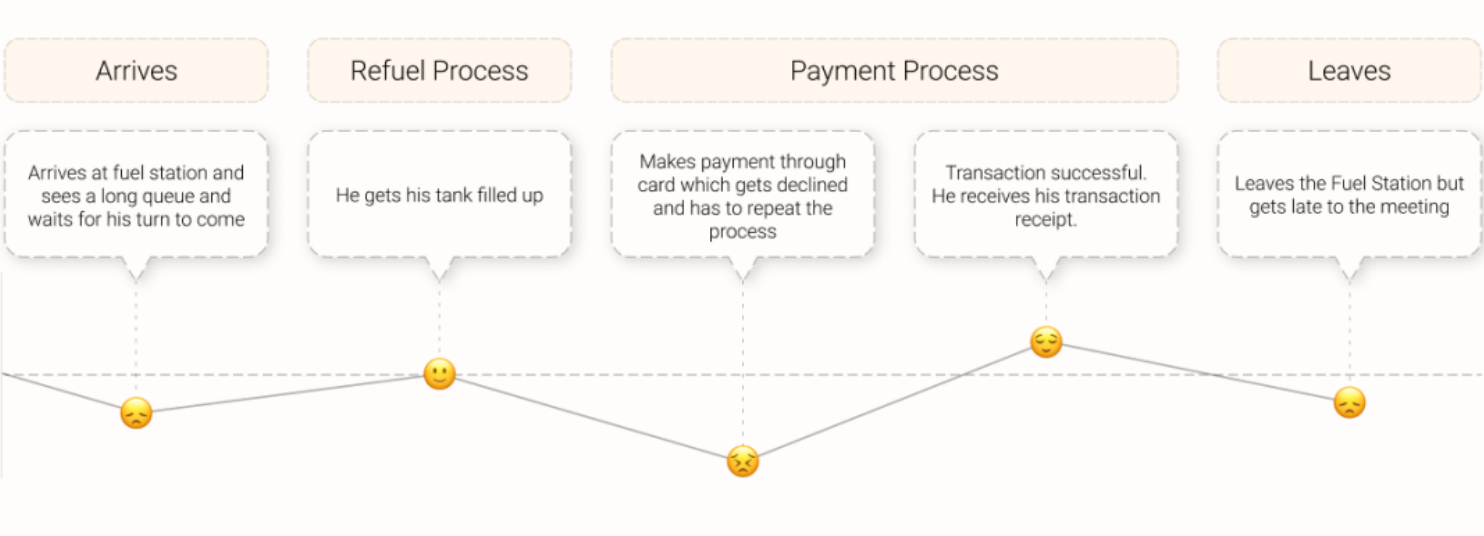
- Extrovert
- Educated
- Sensitive
- Self-Conscious

Devices Used

- Car Infotainment
- Mobile
- Laptop

User Journey

Scenario: His fuel meter indicates that his vehicle is running on reserve fuel, but he has to rush for a important meeting. Since the fuel is not sufficient, he decides to fill his fuel tank on the way.


Arrives
Refuel Process
Payment Process
Leaves
Arrives at fuel station and sees a long queue and waits for his turn to come
He gets his tank filled up
Makes payment through card which gets declined and has to repeat the process
Transaction successful. He receives his transaction receipt.
Leaves the Fuel Station but gets late to the meeting

Persona - Fuel Station Owner

Rajveer Sharma
56 | Sector 26

Bio

Rajveer is a 56 year old who owns a Petrol Pump at Chandigarh Sector 26. He has a dealership with Indian Oil Limited in Sector 26, Chandigarh. Petrol, Diesel, Gas are all available together with other services like Free Air, Lubricants, Drinking Water, Toilets.

Goals and Needs

- He needs to increase revenue from his fuel station
- He wants to keep the expenditure under control
- He wants to better manage traffic and people without additional cost
- He wants to maximize his return on investment
- He wants to attract maximum customers to his petrol pump

Difficulties

- Many customers leave without refueling their vehicles because of huge waiting time
- His revenue is not growing because the station is not able to handle any more customers

Personality

- Mature
- Business-Oriented
- Polite
- Disciplined

Devices Used

- Mobile
- Laptop

Concept Ideation

Fastag

FASTag, launched in 2016, is an **easy-to-use, reloadable tag** that is **affixed on your vehicle's windscreen that uses Radio-Frequency Identification (RFID) technology.** It enables **automatic deduction of toll** charges, without stopping to pay the fees manually. FASTag is linked to a prepaid wallet from which the applicable toll amounts are automatically deducted.

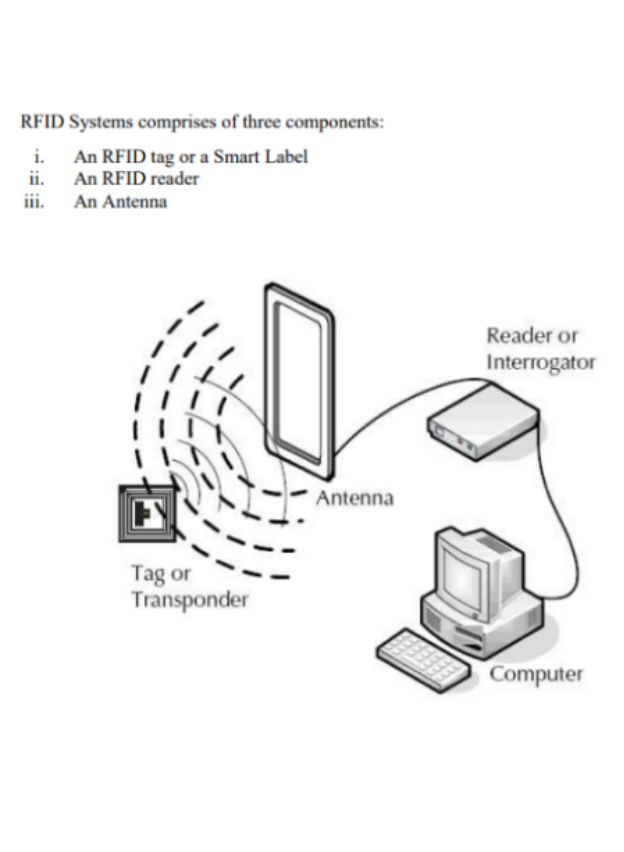
Why prefer Fastag?

There are a few major reasons for using FasTag system to solve the problem at hand of Payments at Fuel Stations:

- It is the only government approved system, mandatory for all vehicles (with at least four wheels) using any national highway
- It is being adopted at a very fast rate with issues of 2,84,70,000 FasTags till Feb-2021
- It has the option to add money to your prepaid wallet using all major payment methods namely UPI, Cards & Net Banking
- This system is successful as it has been able to decrease the waiting time at toll plazas. By using the same technology for payments at Fuel Stations we will be able derive the same benefits.
- Adoption of this FasTag system can be done immediately without much initial investment & infrastructure, as it will reduce the costs of research and development and cost of issuing new FasTags.

RFID Systems comprises of three components:

i. An RFID tag or a Smart Label
ii. An RFID reader
iii. An Antenna

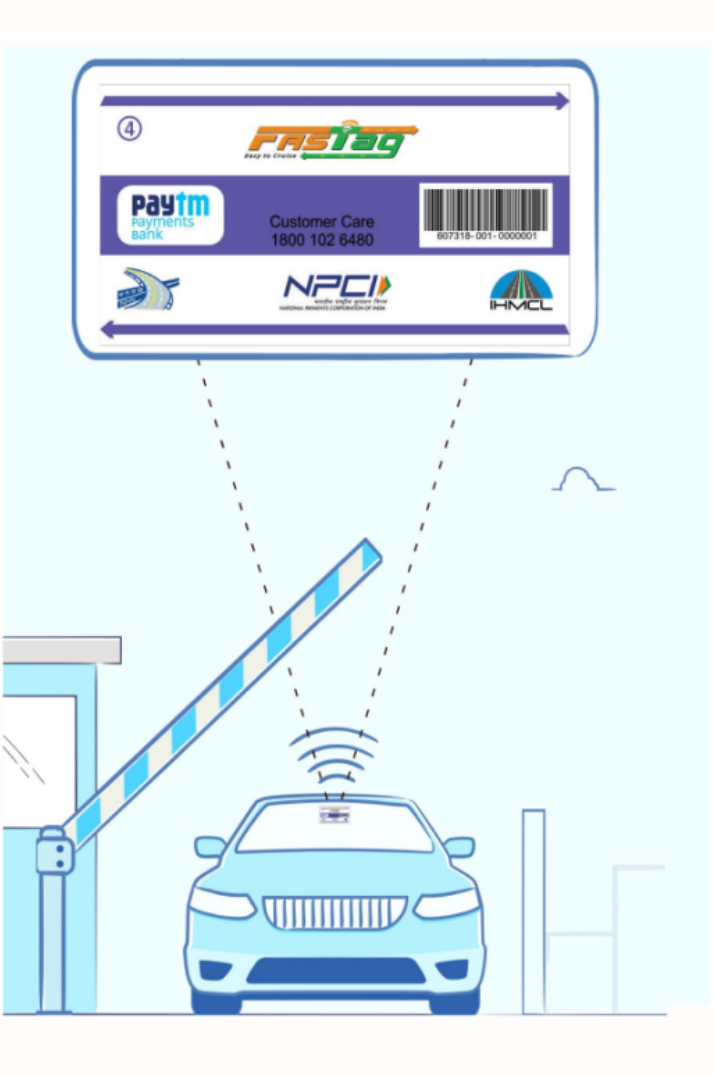

Reader or Interrogator
Antenna
Tag or Transponder
Computer

Concept

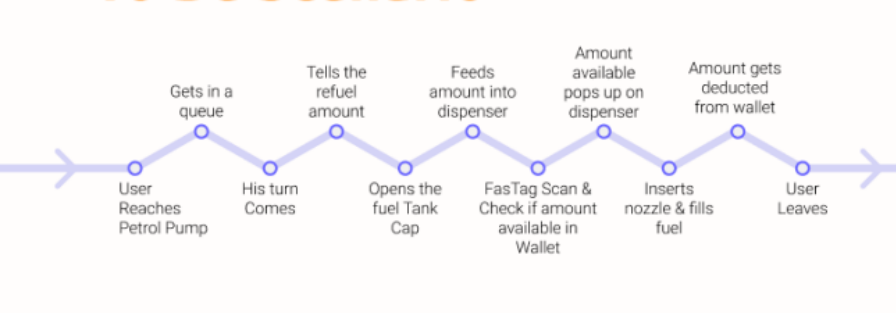
We are using the Fastag (RFID) technology to similarly deduct fuel charges automatically from the linked prepaid wallet just like the toll charges are deducted.

This entire system will also be integrated with the user's registered mobile application and the vehicle's infotainment system wherein a message & notification will be delivered on both the devices as soon as the amount is deducted for information.

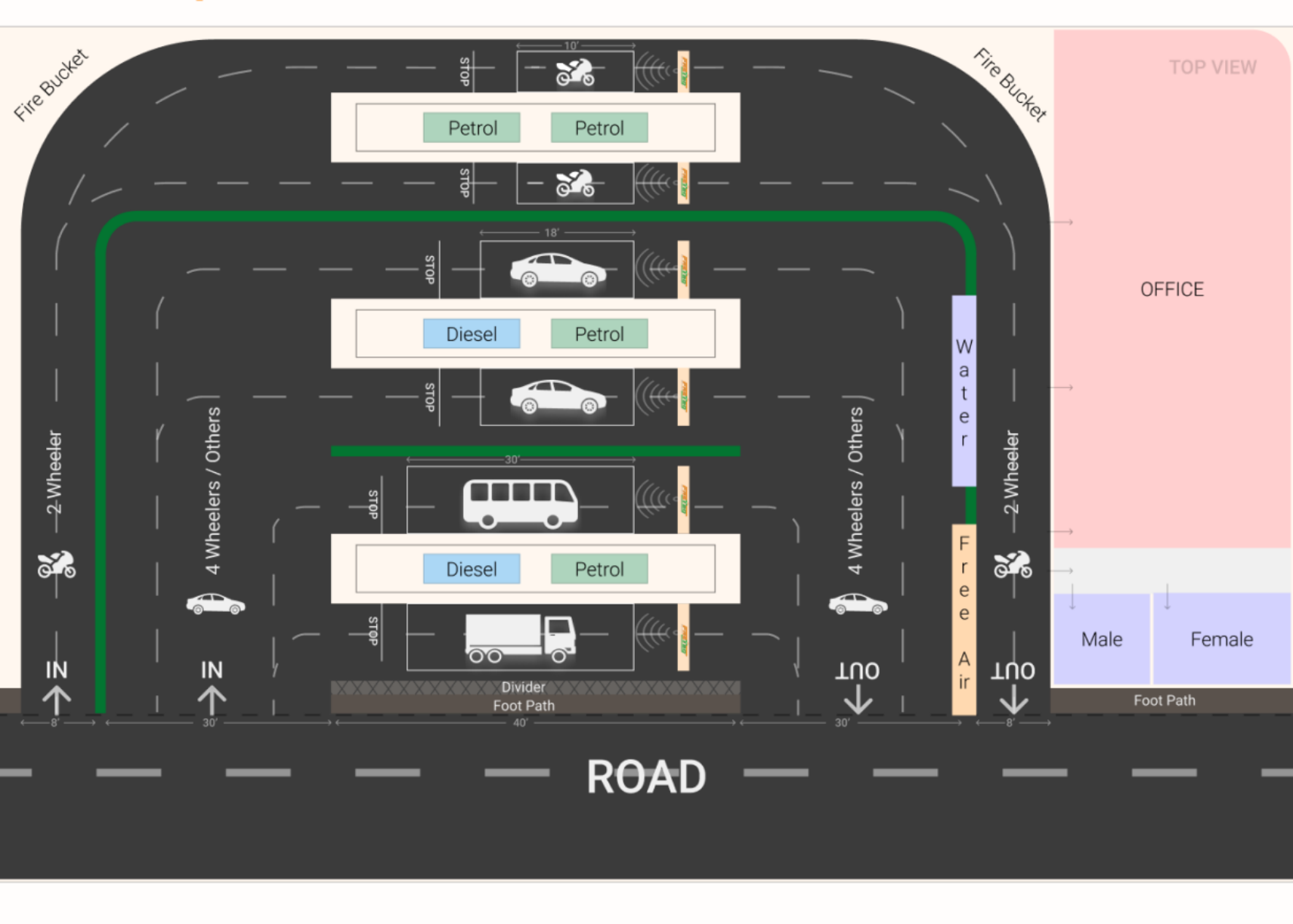
Cars already have a Fastag installed on their windshields. A new category of Fastag needs to be created for two wheelers and installed on the front of their vehicle next to the number plate and be made mandatory.


FASTag
Paytm Payments Bank
Customer Care 1800 102 6480
NPCI
IHMCL

To Be Scenario


User Reaches Petrol Pump
Gets in a queue
His turn Comes
Tells the refuel amount
Opens the fuel Tank Cap
Feeds amount into dispenser
FasTag Scan & Check if amount available in Wallet
Amount available pops up on dispenser
Inserts nozzle & fills fuel
Amount gets deducted from wallet
User Leaves

Conceptual Fuel Station


Fire Bucket
Fire Bucket
TOP VIEW
STOP
Petrol
Petrol
Diesel
Petrol
Diesel
Petrol
OFFICE
Water
Free Air
2 Wheeler
4 Wheelers / Others
4 Wheelers / Others
2 Wheeler
IN
IN
OUT
OUT
Divider
Foot Path
Male
Female
Foot Path
ROAD

Strategic Benefits

To Customer

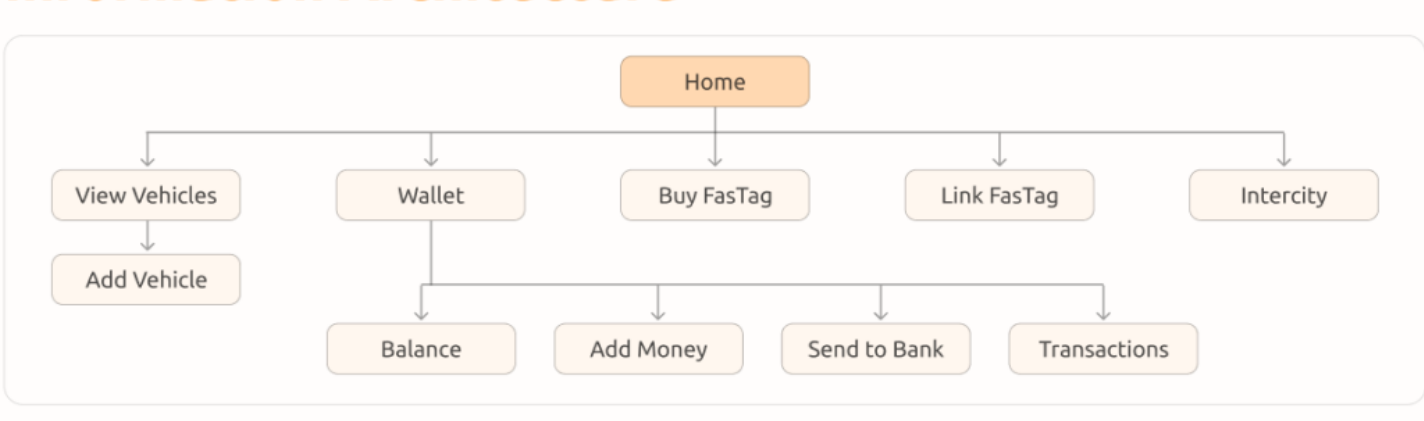
- Hassle free pathway with no overtaking
- Contact-less, Instant payment system
- No issues of Cash change return
- No issues of Transaction Failure or Processing
- Payment processed automatically on refueling
- Complete elimination of payment process time
- Faster overall process

To Fuel Station Owner

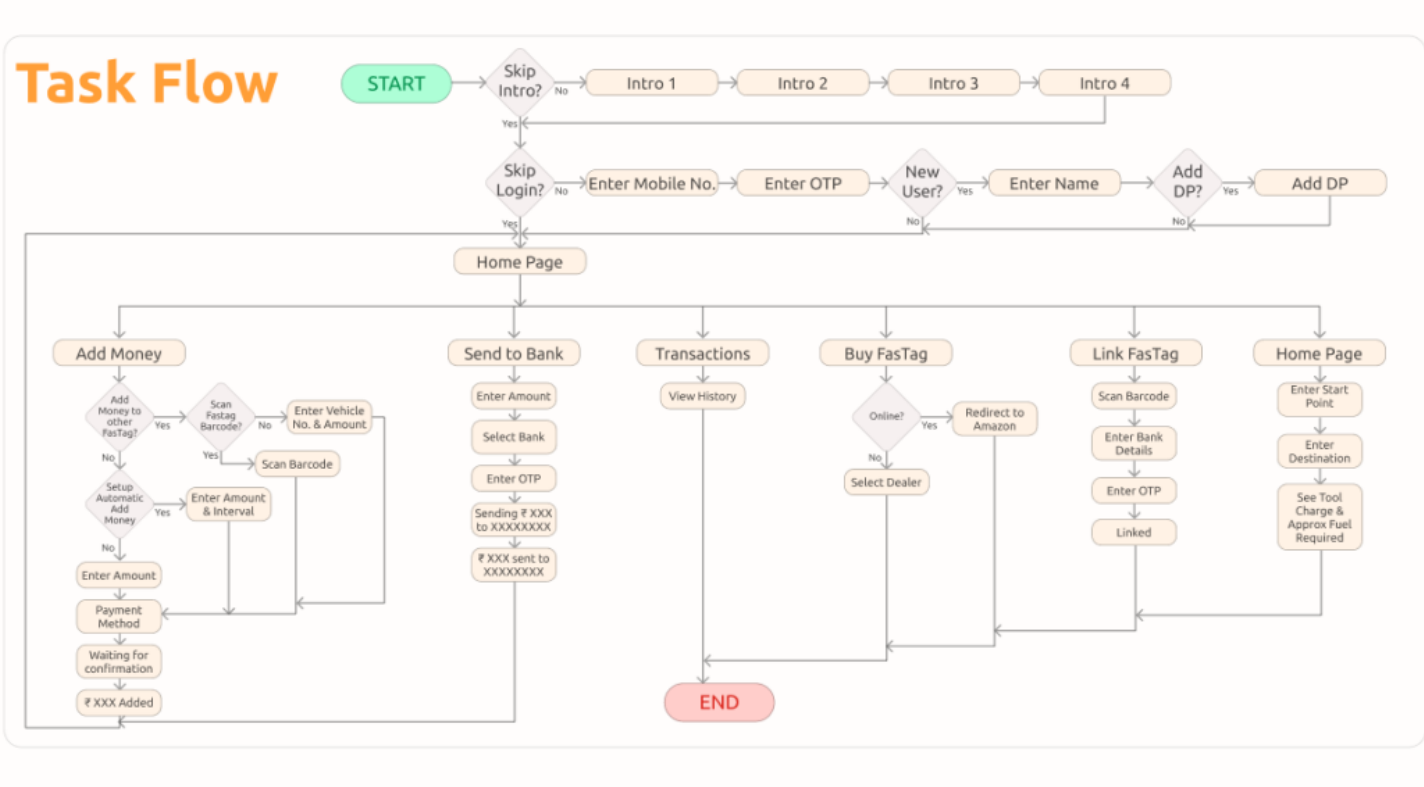
- Entire Operation managed smoothly
- Automated payment system
- No issues of Cash change return
- No issues of Transaction Failure or Processing
- Complete elimination of payment process time
- Time saved can be used for more vehicle refueling
- Results in increased revenue and profits

Mobile Application

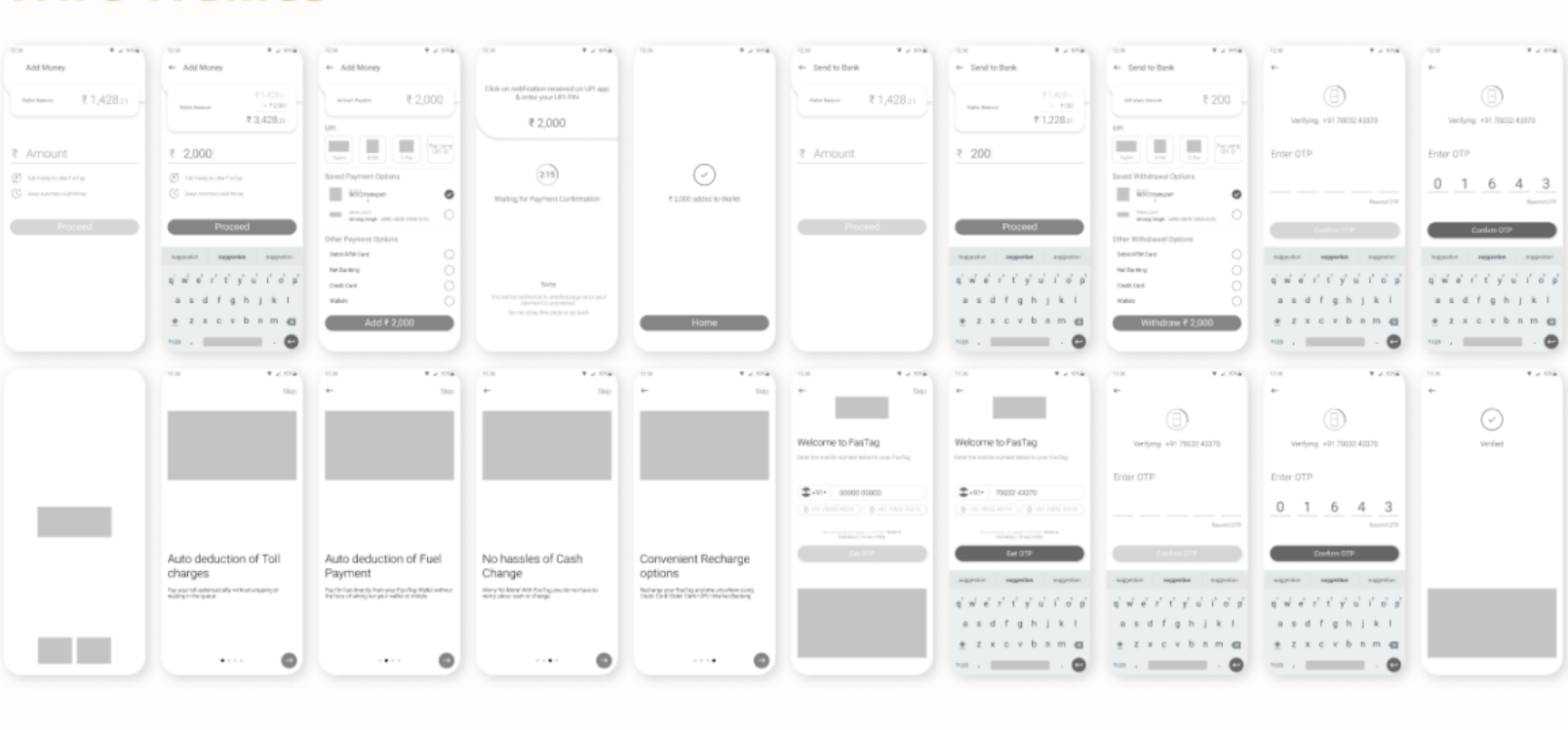
Information Architecture


Home
View Vehicles
Add Vehicle
Wallet
Balance
Add Money
Send to Bank
Transactions
Buy FasTag
Link FasTag
Intercity

Task Flow

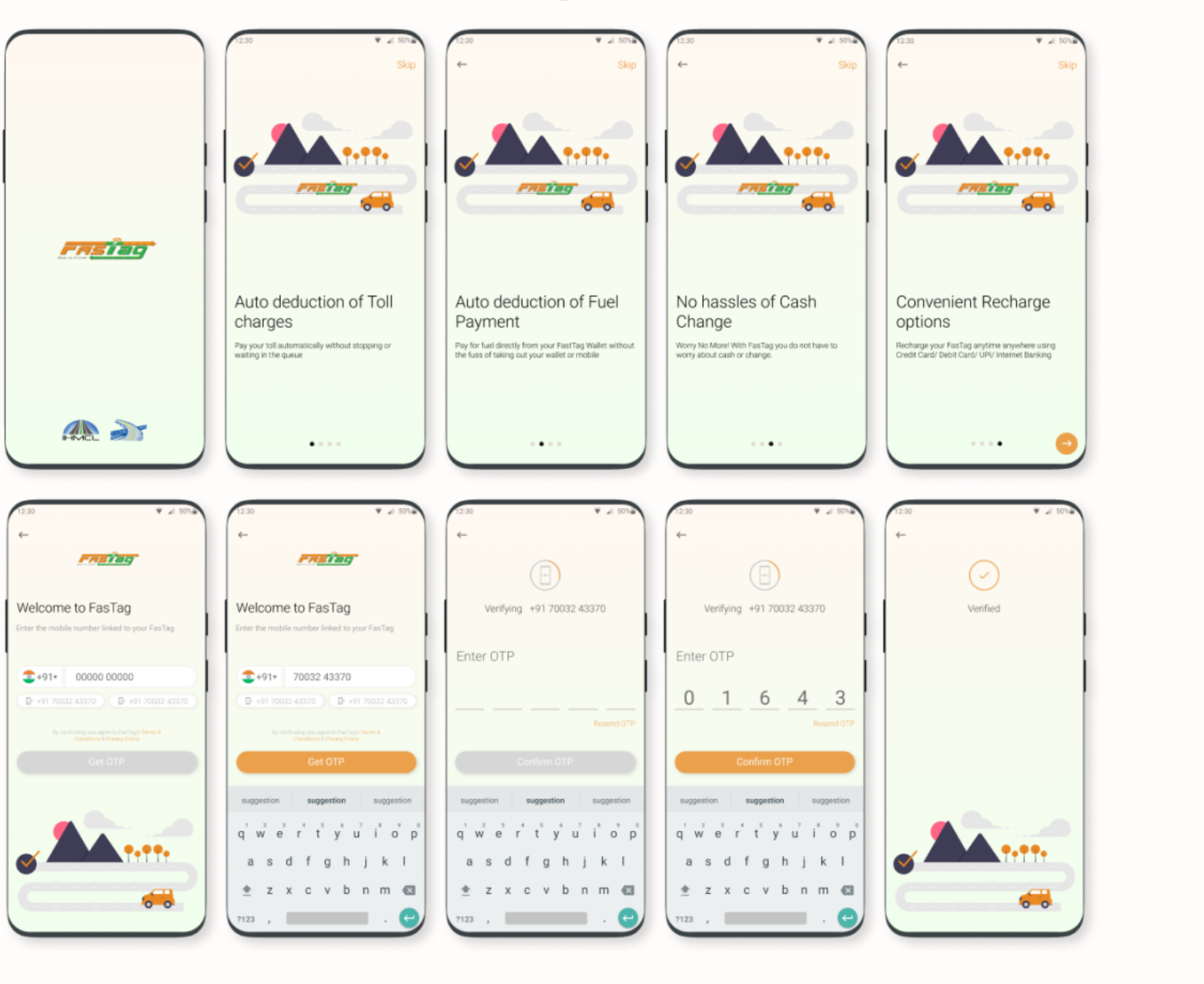

START
Skip Intro?
Intro 1
Intro 2
Intro 3
Intro 4
Skip Login?
Enter Mobile No.
Enter OTP
New User?
Enter Name
Add DP?
Add DP
Home Page
Add Money
Send to Bank
Transactions
Buy FasTag
Link FasTag
Home Page
Enter Amount
Select Bank
Enter OTP
View History
Online?
Redirect to Amazon
Select Dealer
Scan Barcode
Enter Bank Details
Enter OTP
Linked
Enter Start Point
Enter Destination
See Toll Charge & Approx Fuel Required
Enter Vehicle No. & Amount
Scan Barcode
Enter Amount & Interval
Enter Amount
Payment Method
Waiting for confirmation
₹ XXX Added
END

Wire-frames

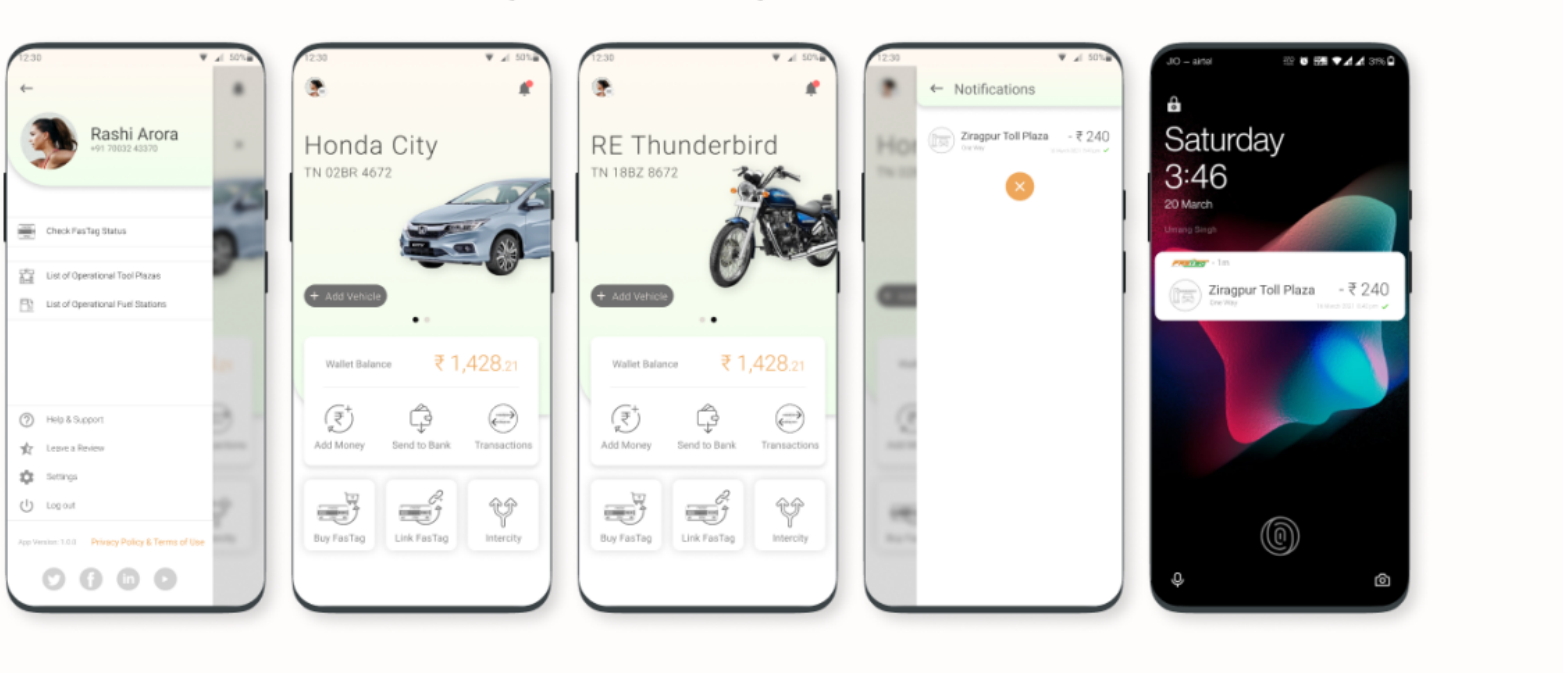


Visuals

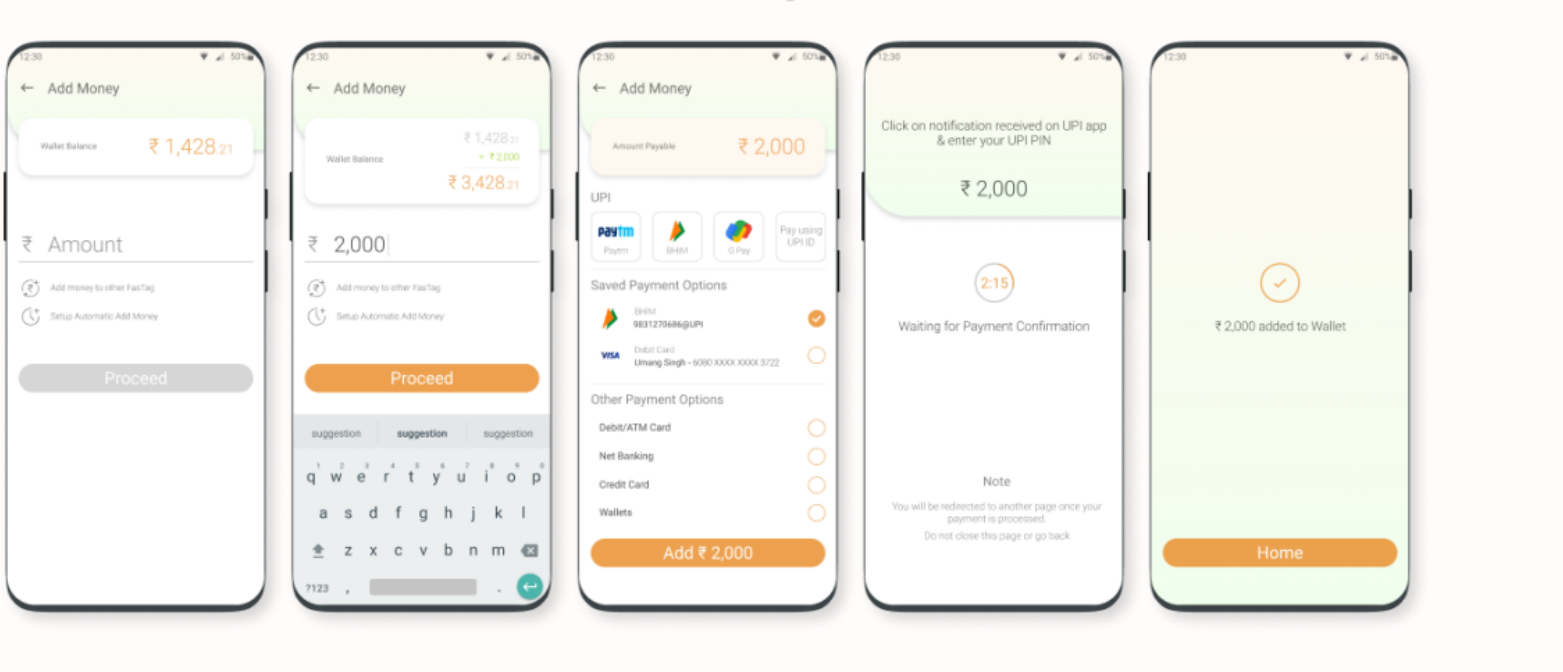
On-boarding Screens


FASTag
Skip
Auto deduction of Toll charges
Auto deduction of Fuel Payment
No hassles of Cash Change
Convenient Recharge options
Welcome to FasTag
Get OTP
Enter OTP
0 1 6 4 3
Confirm OTP
Verified

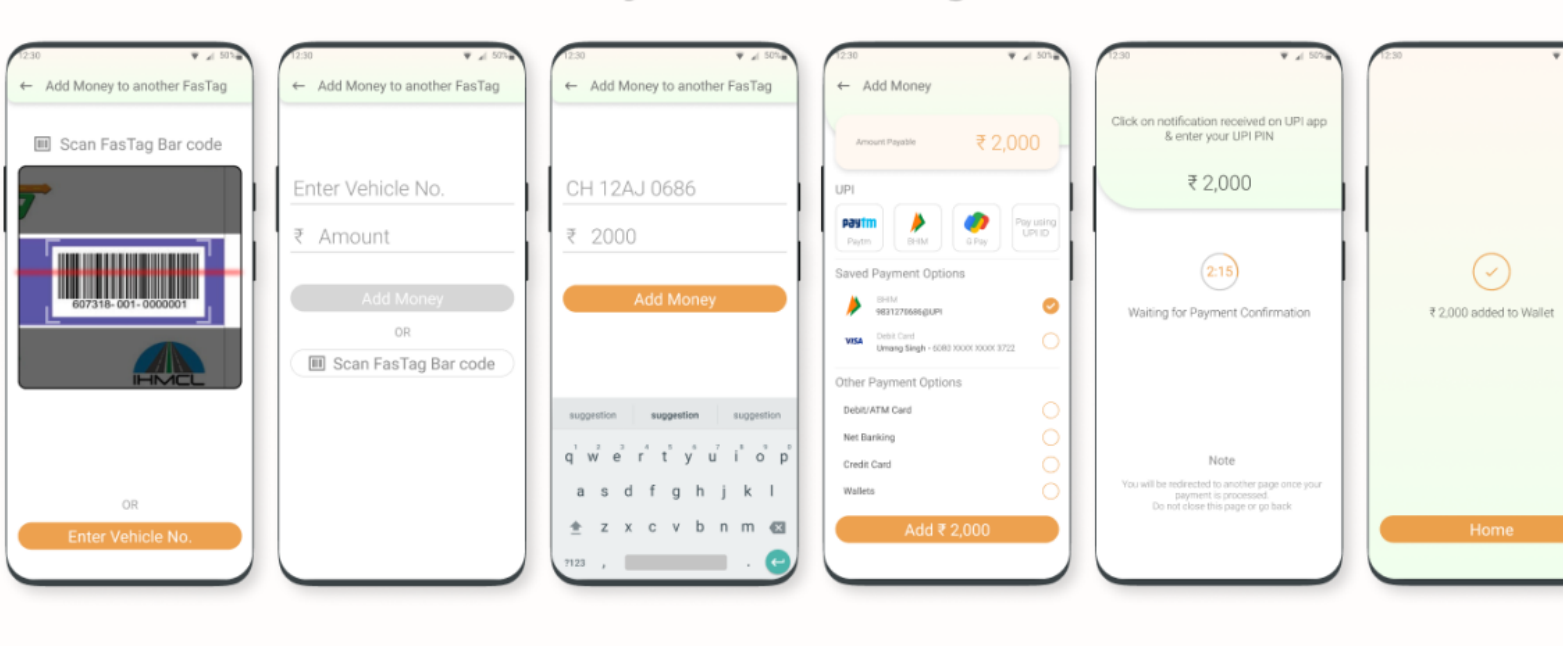
Menu, Home Screen, Notifications


Rashi Arora
Honda City
RE Thunderbird
₹ 1,428
Add Money
Send to Bank
Transactions
Buy FasTag
Link FasTag
Intercity
Notifications
Ziragpur Toll Plaza
₹ 240
Saturday
3:46

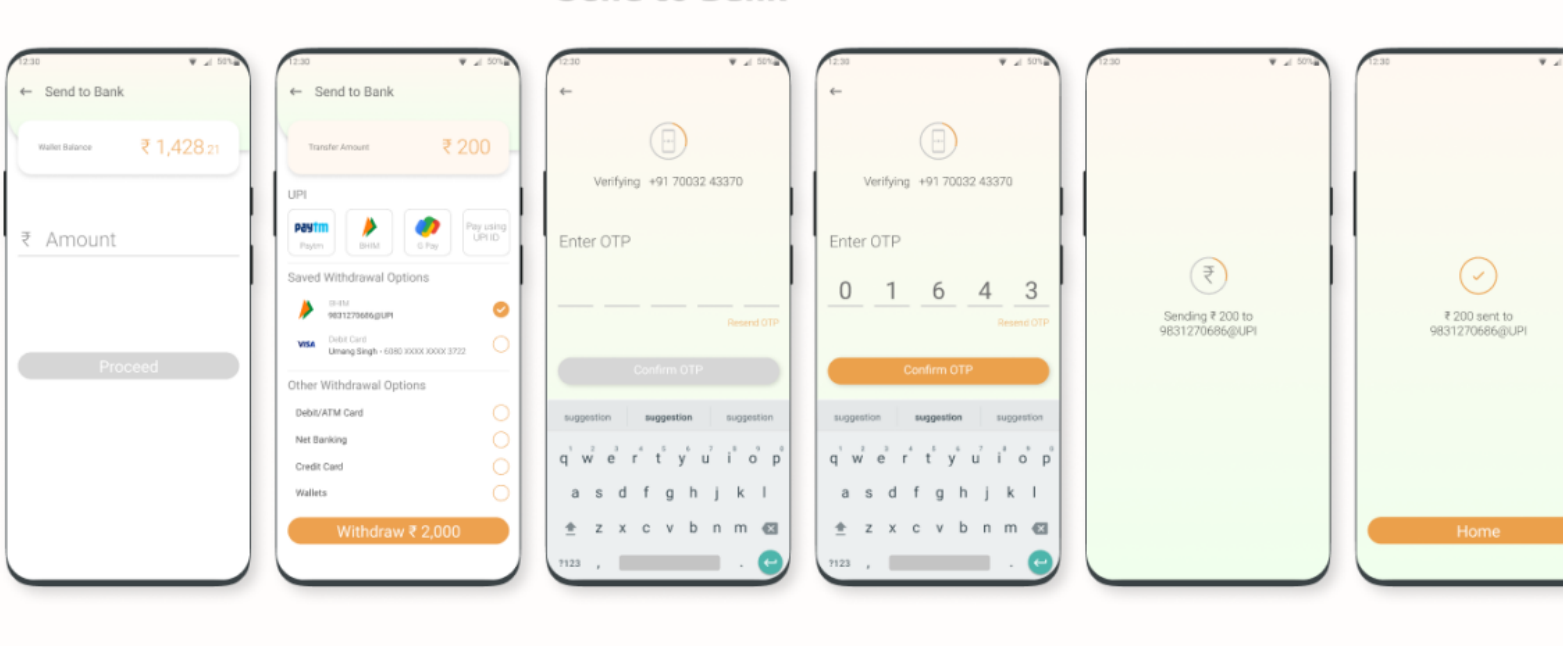
Add Money


Add Money
₹ 1,428
Amount
Proceed
₹ 2,000
Saved Payment Options
Other Payment Options
Add ₹ 2,000
Waiting for Payment Confirmation
₹ 2,000 added to Wallet
Home

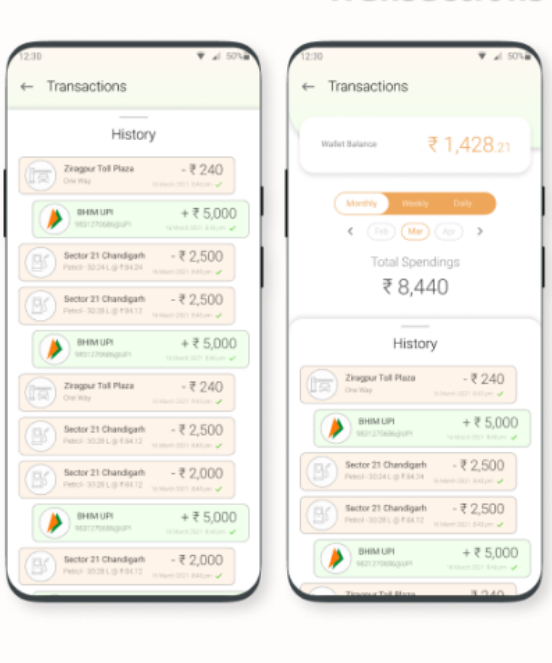
Add Money to another FasTag

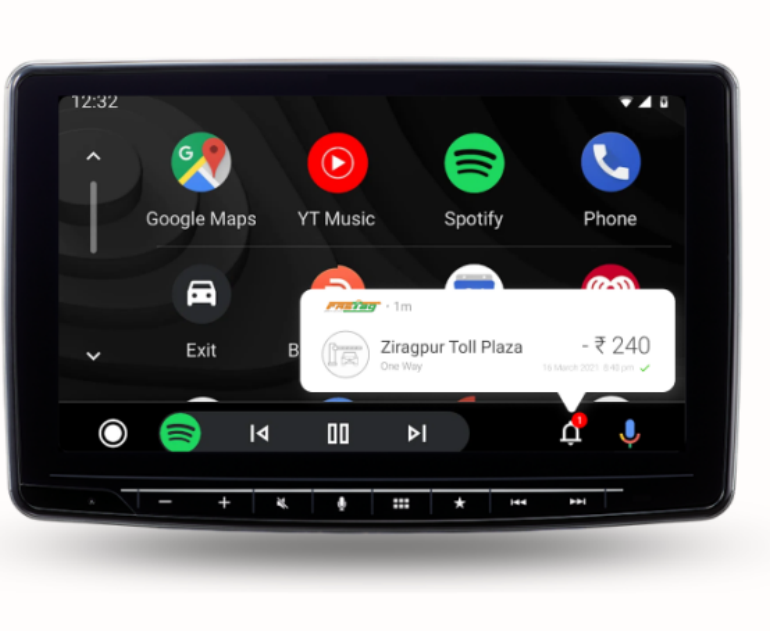

Add Money to another FasTag
Scan FasTag Bar code
Enter Vehicle No.
Amount
CH 12AJ 0686
2000
Add Money
Add ₹ 2,000
Waiting for Payment Confirmation
₹ 2,000 added to Wallet
Home

Send to Bank


Send to Bank
₹ 1,428
Amount
Proceed
₹ 200
Saved Withdrawal Options
Other Withdrawal Options
Withdraw ₹ 2,000
Enter OTP
0 1 6 4 3
Confirm OTP
Home

Transactions , Car Infotainment Notification


Transactions
History
Ziragpur Toll Plaza
- ₹ 240
+ ₹ 5,000
- ₹ 2,500
- ₹ 2,000
₹ 1,428
Total Spendings
₹ 8,440


12:32
Google Maps
YT Music
Spotify
Phone
Exit
Ziragpur Toll Plaza
- ₹ 240

Prototype Link

We have also created a running prototype of the UI that you can open and use like a real mobile application.

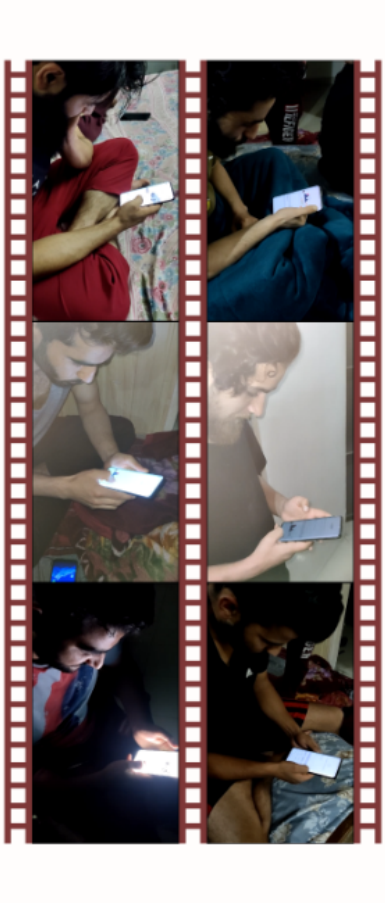
Click Here

Usability Testing

Segment	Name	Age	Task Status	Task 1 (Sec)	Task 2 (Sec)	Task 3 (Sec)
Potential Users	Intikhab Bhat	29	Completed	24	12	4
	Muzamil Marzoor	24	Completed	26	10	8
	Adil Tariq Dar	22	Completed	25	14	6
Target Users	Halil Rahim	23	Completed	28	16	3
	Aakash Manzoor	22	Completed	22	12	5
	Khursheed Hakim	24	Completed	34	13	6

Task 1: Add Money to Wallet
Task 2: Withdraw Money from Wallet
Task 3: View Transactions History

Video Link: Click Here



Future Scope

- Smart Number Plates with FasTag System Integration to replace current system of FasTags
- Parking Systems can be integrated with FasTags for Payment of charges
- Vehicle Insurance, POC, Vehicle RC and other vehicle related documents can be linked to your FasTag and be available on the Application
- Payments for renewal of Insurance, POC & Penalty Charges can also be integrated with FasTag
- One Transaction Credit System can also be introduced

Thank You for Scrolling...

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