Transforming Fuel Tracking: Enhancing User Experience for Fleet Owners

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Abstract: *This research paper documents a UI/UX design project aimed at solving the problem of fuel transparency for fleet owners through the development of a mobile application. Motivated by the desire to enhance the user experience and empower fleet owners, the study focuses on installing sensors in trucks to accurately measure fuel levels. These measurements are then displayed in a mobile application, providing real-time information to fleet owners. The results of this design intervention demonstrate the successful resolution of the problem, enabling fleet owners to make informed decisions regarding fuel management. The implications of this research include improving user experience and addressing the specific challenges faced by fleet owners in their fueling processes.*

Keywords: Fleet management, Fuel transparency, Design solutions, UI/UX design, Real-time information
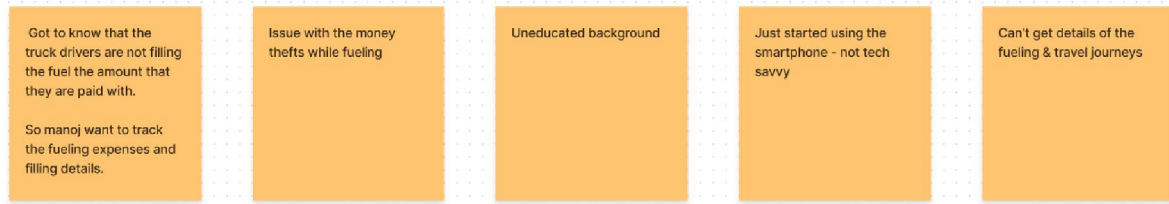
I. INTRODUCTION

Fuel management is a critical aspect of fleet operations, directly impacting the bottom line of fleet owners. However, challenges arise when fleet owners cannot accurately verify the amount of fuel being filled in their trucks, leading to potential losses and trust issues. This research paper focuses on the intersection of UI/UX design and fueling processes, aiming to develop a mobile application that addresses these concerns for fleet owners, taking the user persona of Manoj from Rewari, Haryana, as a representative example. By leveraging the principles of UI/UX design, the mobile application provides Manoj & other fleet owners with real-time information on fuel levels, ensuring transparency and instilling trust. Through a detailed analysis and implementation of design solutions, this paper seeks to empower fleet owners, like Manoj, by delivering a seamless and reliable fueling experience that aligns with their specific needs & concerns.

II. DESIGN THINKING PROCESS

Design thinking is a user-centric problem-solving approach that fosters innovation and creativity. In this research paper, we have embraced the design thinking process, consistently prioritizing the perspective of the end user, represented by Manoj. The process encompasses five key stages: empathize, define, ideate, prototype, and test. Through empathy, we gain a deep understanding of Manoj's needs and challenges. With a defined problem statement, we generate diverse ideas in the ideation phase. Prototyping enables us to transform concepts into tangible representations, which are then tested to gather valuable user feedback. By following this iterative and user-centered process, we aim to develop effective and impactful solutions for Manoj's fueling process concerns.
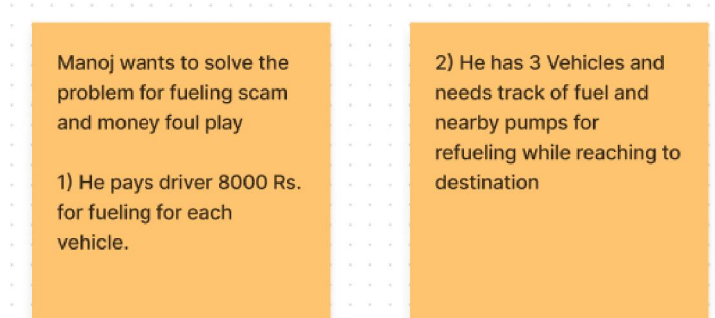

" Manoj is the User "

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2.1 Empathize

| Got to know that the truck drivers are not filling the fuel the amount that they are paid with. So manoj want to track the fueling expenses and filling details. | Issue with the money thefts while fueling | Uneducated background | Just started using the smartphone - not tech savvy | Can't get details of the fueling & travel journeys |

Empathizing with the end user, Manoj, reveals the following current issues:

- **Inaccurate fueling by truck drivers:** Manoj discovered that the fuel amount filled by drivers doesn't match the payment. He wants to track fueling expenses and details accurately.
- **Money theft during fueling:** Manoj faces the problem of potential theft during the fueling process, which necessitates a secure payment system.
- **Limited education:** Manoj's lack of formal education poses a challenge in understanding complex technology solutions.
- **New smartphone user:** Manoj is new to using smartphones and lacks familiarity with their features.
- **Lack of fueling and travel details:** Manoj cannot access comprehensive information about fueling expenses and travel journeys.

Understanding these challenges helps in designing a user-friendly mobile application that addresses Manoj's needs and enhances his fueling experience.
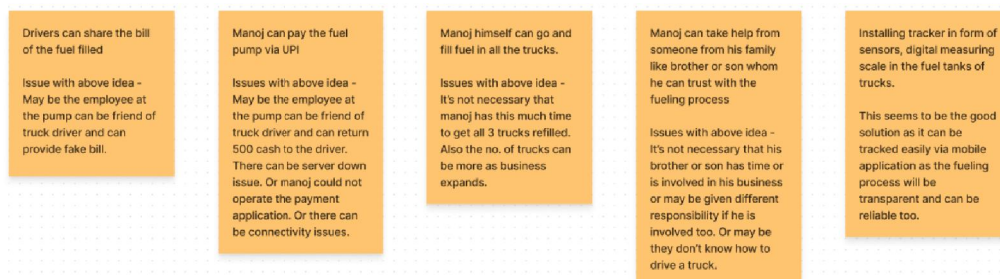
2.2 Define

| Manoj wants to solve the problem for fueling scam and money foul play

1) He pays driver 8000 Rs. for fueling for each vehicle. | 2) He has 3 Vehicles and needs track of fuel and nearby pumps for refueling while reaching to destination |

Defining the problem for Manoj, the end user:

Manoj faces the challenge of fueling scams and money foul play in his fleet management. He pays each driver 8000 Rs. for fueling per vehicle, but suspects discrepancies in the actual fuel amount filled. Additionally, with three vehicles to manage, Manoj needs a solution that enables him to track fuel consumption accurately and find nearby fuel stations for refueling during his journeys. The defined problem revolves around addressing fueling fraud, ensuring transparency, and providing convenient access to fueling locations for efficient fleet management.

2.3 Ideate

| Drivers can share the bill of the fuel filled

Issue with above idea - May be the employee at the pump can be friend of truck driver and can provide fake bill. | Manoj can pay the fuel pump via UPI

Issues with above idea - May be the employee at the pump can be friend of truck driver and can return 500 cash to the driver. There can be server down issue. Or manoj could not operate the payment application. Or there can be connectivity issues. | Manoj himself can go and fill fuel in all the trucks.

Issues with above idea - It's not necessary that manoj has this much time to get all 3 trucks refilled. Also the no. of trucks can be more as business expands. | Manoj can take help from someone from his family like brother or son whom he can trust with the fueling process

Issues with above idea - It's not necessary that his brother or son has time or is involved in his business or may be given different responsibility if he is involved too. Or may be they don't know how to drive a truck. | Installing tracker in form of sensors, digital measuring scale in the fuel tanks of trucks.

This seems to be the good solution as it can be tracked easily via mobile application as the fueling process will be transparent and can be reliable too. |

Ideating solutions for Manoj's problem as a fleet owner:

2.4 Drivers sharing fuel bills

Issue: Potential collusion between drivers and pump employees, leading to fake bills.

Manoj paying via UPI:

Issues: Possible collusion between pump employees and drivers, cash return to the driver, server downtime, payment app operation difficulties, and connectivity issues.

Manoj personally fueling the trucks:

Issues: Time constraints and scalability as the number of trucks increases.

Seeking help from a trusted family member:

Issues: Time availability, involvement in the business, and potential lack of truck driving skills.

Installing sensors and digital measuring scales in fuel tanks:

This solution offers transparency and reliability through a mobile application, allowing easy tracking of fueling processes.

Among the ideas generated, installing sensors and digital measuring scales in the fuel tanks of trucks emerges as a promising solution. It ensures transparency, reliable tracking, and can be conveniently managed through a mobile application.

2.5 Prototype
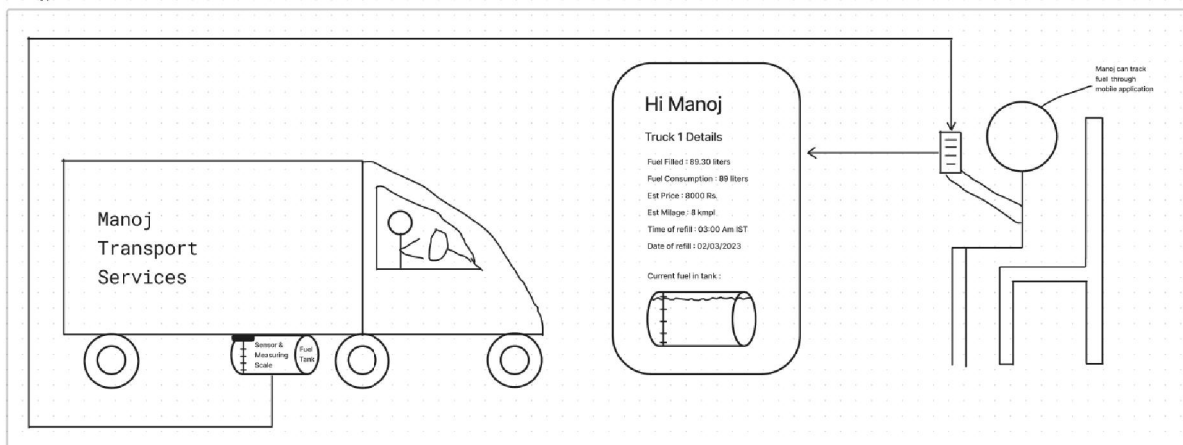
Prototyping for the solution that we arrived

In the above image, a rapid prototype is showcased, featuring a sensor installed in the truck. This allows Manoj to effortlessly monitor the fuel tank capacity.

2.6 Test

Testing the solution for the identified problem involves considering the following points:

Manoj's smartphone proficiency:

Challenges may arise as Manoj is new to using smartphones, potentially leading to difficulties in efficiently operating the application.

Language barrier for Manoj:

As Manoj comes from an uneducated background, he may face challenges in reading and understanding the language used in the mobile application.

Connectivity issues with remote sensors:

During the initial setup, Manoj might encounter difficulties in establishing a connection with the remote sensors, which could impact the functionality of the system.

Adding and accessing vehicle details:

Manoj may encounter issues while inputting and accessing vehicle details within the application, potentially due to the complexity of the process or lack of familiarity with technology.

Testing will address these concerns and focus on enhancing usability, language accessibility, establishing reliable sensor connections, and simplifying the process of adding and accessing vehicle information.
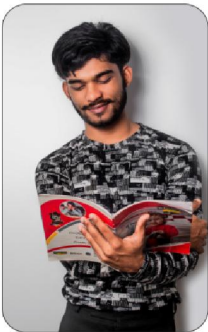
III. USER EXPERIENCE DESIGN PROCESS

3.1 User Research

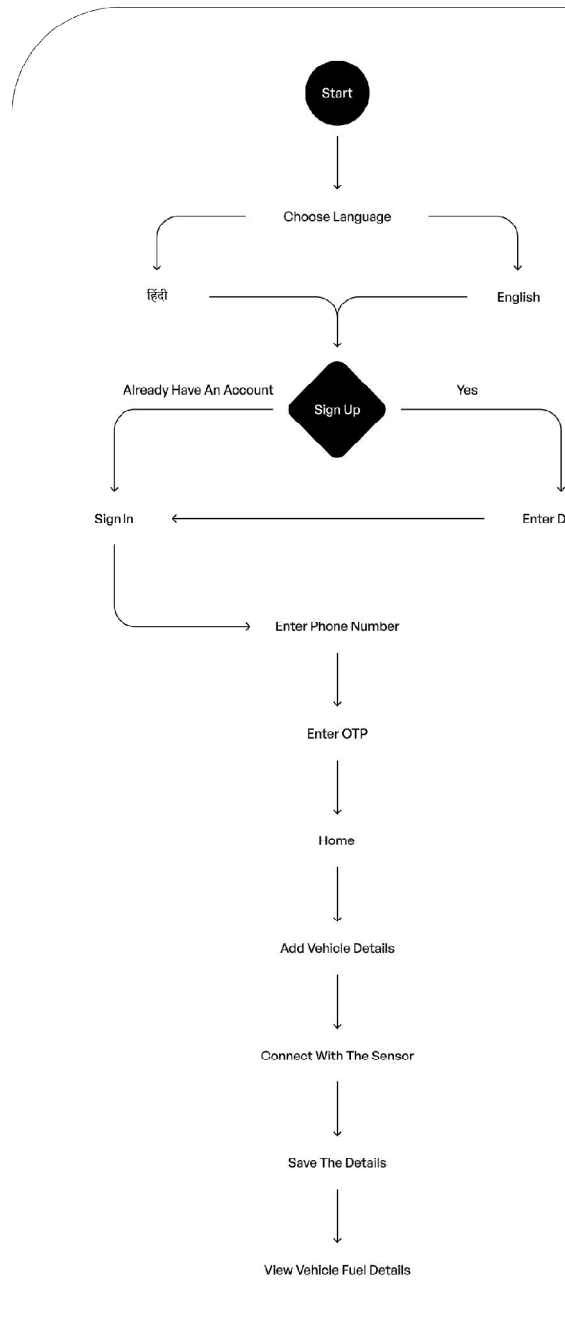| Primary Research	Secondary Research
Primary Research Includes one to one conversation with the end user but here we don't have option to have interview with Manoj.	Secondary Research is the data available for the users which may be online or derive through interviews.
Yet there is some data that is mentioned about Manoj that we will take care while designing Uneducated Background. Have just started to use Smart Phone. Lives in Rewari, Haryana. Has Negligible Tech Knowledge. Owns 3 Trucks.	So, we will assume some of the things as per the data available about Manoj. As people of Rewari speak Hindi so we assume that Manoj knows Hindi - Speaking & Reading. As Manoj is less tech savvy he might need some kind of assistance using the application.

3.2 User Persona

3.3 User Flow

3.4 User Interface Design Process
Onboarding Screens
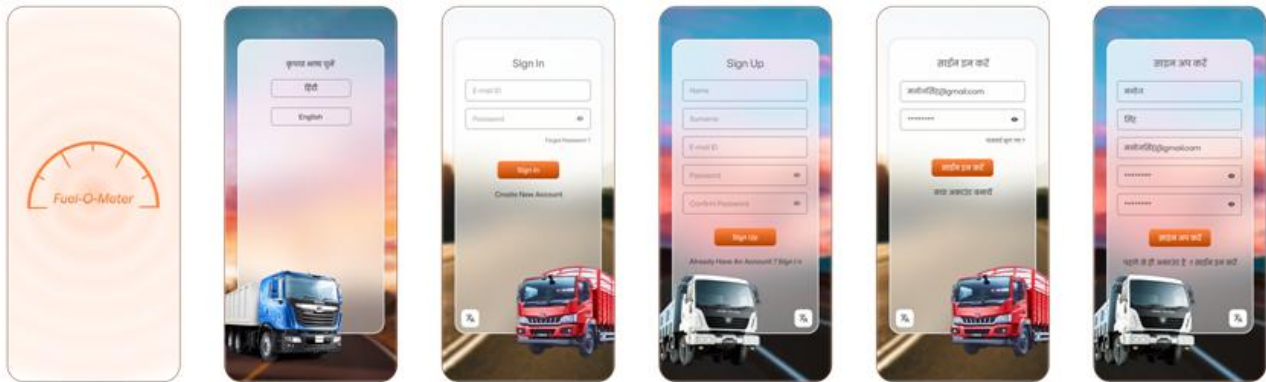
Home, Truck Details, Profile, Menu & Statistics Screens
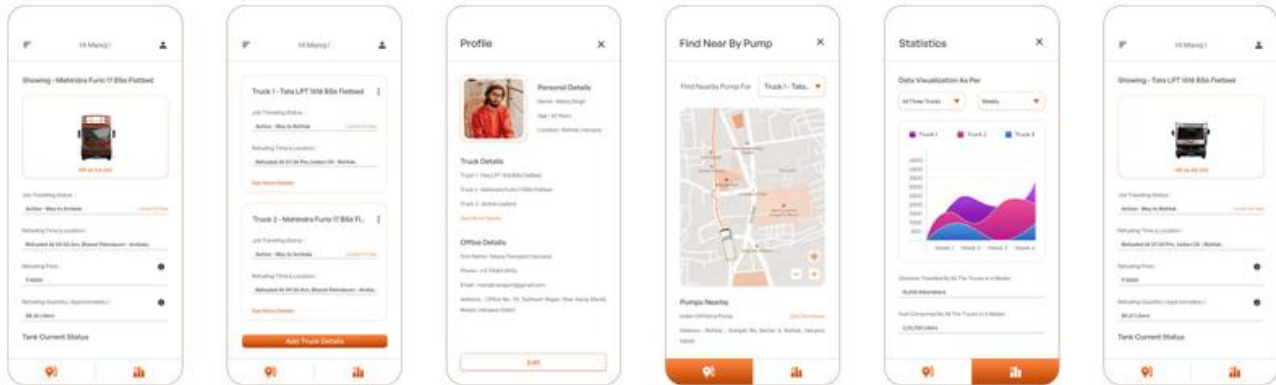
IV. CONCLUSION

In conclusion, our research paper focused on the UI/UX design of a mobile application tailored to the needs of fleet owners. By meticulously following the design process, we successfully addressed the problem of tracking fuel levels in trucks and actively involving fleet owners in the fueling process. Our innovative application design provides an intuitive interface that enables fleet owners to seamlessly engage in fueling and obtain real-time information on fuel levels.

Through the integration of sensors and advanced measurement technology, our application ensures accuracy and transparency in fuel consumption tracking. This empowers fleet owners to make informed decisions regarding their fuel resources and effectively manage their fleet operations. By prioritizing user-centered design principles, we have created an application that simplifies the fueling process and enhances the overall user experience for fleet owners.

In summary, our UI/UX design solution has effectively solved the problem faced by fleet owners, enabling them to easily participate in the fueling process and gain comprehensive insights into the fuel levels of their trucks. This research highlights the significance of user-centric approaches in creating practical and efficient solutions that enhance user engagement and streamline fleet management processes

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