



UNIVERSITY OF BUEA



FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER ENGINEERING

2022/2023 ACADEMIC YEAR

Title:

DESIGN AND IMPLEMENTATION OF PASSENGER POSITIONING SYSTEM

Course Title:

CEF440

Internet Programming and Mobile Programming

Supervisor:

DR. NKEMENI VALERY

Group Members:

NAME	MATRICULE
NGUESSONG ANIKUI SUZY	FE20A079
TENDONGMOH DELEO ANANGFAC	FE20A117
NKEMATABONG DIRAN FOLEFAC	FE20A089
LEGIMA DONALD	FE20A055
CHI AZAH SHEYRHON	FE20A027

26th MAY 2023

Table of Contents

1. Introduction:.....	2
2. Research and Analysis:	3
3. Design Process	4
4. Design Strategy:.....	5
5. Design Concepts:	6
6. Usability Testing:	7
7. Final Design:.....	8
8. Implementation:	12
9. Conclusion:	12

1. Introduction:

The goal of this project is to create a user interface and user experience (UI/UX) for a passenger positioning system. The system is designed to help reduce passenger waiting time and optimize fuel usage for drivers in the city. It does this by providing a real-time view of passenger locations on a map. Passengers can choose to share their location or not and also see the location of other passengers. However, drivers' locations are not visible to passengers. The system is intended to improve the efficiency of ride-hailing services and enhance the overall user experience for both drivers and passengers. This design was done taking into consideration the seven principles of design which are:

- Balance
- Scale
- Contrast
- Pattern
- Movement and Rhythm
- Emphasis
- Unity

2. Research and Analysis:

In the discovery phase of the project, we conducted user interviews and surveys to gain insights into the needs and behaviors of drivers and passengers. We also conducted competitive analysis to identify best practices and key features of similar systems. Based on our research, we identified the following key user needs: reduced waiting time for passengers, optimized fuel usage for drivers, ease of use, real-time updates, location privacy, and user control.

- Ease of use:

One of the key user needs identified was the importance of ease of use. Users expect the system to be intuitive and easy to navigate to avoid confusion and frustration. The design strategy was focused on creating a simple and user-friendly interface that would allow users to quickly and easily perform the desired actions, such as viewing passenger locations or toggling location sharing preferences.

- Real-time updates:

Another key user need identified was the importance of real-time updates. Users expect to have access to up-to-date information, such as the location of other passengers or the estimated time of arrival for their ride. The design strategy focused on creating a system that would provide real-time updates to both drivers and passengers, allowing them to make informed decisions about their travel plans.

- Location privacy:

User privacy is a top concern for many users, especially when it comes to sharing their location information. The design strategy focused on providing clear and prominent options for users to choose whether to share their location or not. The system was designed to give users full control over their location sharing preferences, with clear and easy-to-understand controls to ensure that users can make informed decisions about their privacy.

- User control:

Finally, another key user need identified was the importance of user control. Users expect to have control over their experience with the system, including the ability to customize their preferences and settings. The design strategy focused on providing users with a high degree of control over their experience with the system. This includes features such as the ability to toggle location sharing preferences, view the location of other passengers, and customize settings such as notifications and preferences. By giving users control over their experience with the system, we aimed to create a user-centered design that would meet the needs of a wide range of users.

3. Design Process

1. Brainstorming:

- Conducted brainstorming sessions with the design team to generate ideas and gather initial requirements.
- Explored different concepts and features to enhance the passenger positioning system's functionality and user experience.

2. Wireframing:

- Utilized Figma, a collaborative design tool, to create wireframes of the system's user interface.
- Developed low-fidelity wireframes to outline the basic layout, content structure, and navigation flow.
- Iteratively refined the wireframes based on feedback and usability considerations.

3. Prototyping:

- Transformed the wireframes into interactive prototypes using Figma's prototyping features.
- Added interactive elements, transitions, and animations to simulate the system's behavior.
- Conducted usability testing on the prototypes to gather user feedback and validate design decisions.

4. Iteration:

- Incorporated feedback from usability testing sessions into the design.
- Iteratively refined the prototypes, making adjustments to improve user interactions and address usability issues.
- Collaborated with stakeholders, including the development team and project manager, to align the design with technical feasibility and project constraints.

5. Design Principles, Guidelines, and Frameworks:

- Adhered to principles of simplicity, consistency, and intuitiveness to enhance the user experience.
- Followed Material Design guidelines to ensure a modern and visually appealing interface.
- Leveraged responsive design principles to ensure the system's compatibility across different devices and screen sizes.
- Utilized design frameworks such as Bootstrap to streamline the development process and ensure consistency in UI components and layouts.

6. Collaborative and Iterative Design Methods:

- Fostered a collaborative environment by encouraging feedback and ideas from team members and stakeholders throughout the design process.
- Conducted regular design review meetings to discuss progress, gather input, and address any design challenges.
- Iteratively refined the designs based on feedback, user testing, and iterative development cycles.

4. Design Strategy:

Based on the user needs identified, we developed a design strategy that focuses on simplicity, clarity, and user control. We created personas and user scenarios to guide the design process, and

developed user flows to ensure a seamless user experience. Our design strategy also emphasizes the importance of location privacy and user control, with clear options for passengers to choose whether to share their location or not.

Overall, the design strategy focused on creating a simple, intuitive, and user-centered interface that meets the needs of a wide range of users. By emphasizing simplicity, clarity, user control, location privacy, and accessibility, we aimed to create a design that provides a satisfying user experience and meets the business goals of reducing passenger waiting time and optimizing fuel usage for drivers.

5. Design Concepts:

This is the core idea driving the design of a product, explained via a collection of sketches, images, and a written statement. This helps the designers and, later, the developers stay on track throughout the creative process, ensuring they bring a product to market with value to target users. The following points are some of the design concepts taken into consideration in this piece of work:

- Safety: Passenger Positioning System can be used to track the location of passengers in the event of an accident, which can help first responders to quickly locate and rescue passengers.
- Security: Passenger Positioning System can be used to track the location of passengers in order to prevent unauthorized access to certain areas of the vehicle.
- Comfort: Passenger Positioning System can be used to track the location of passengers in order to provide them with personalized services, such as adjusting the temperature or lighting in their seat. A feature we hope to implement in later versions.
- GPS: GPS is a global positioning system that can be used to track the location of objects on the Earth's surface.
- Wi-Fi: Wi-Fi is a wireless networking technology that can be used to track the location of devices that are connected to a Wi-Fi network.
- Bluetooth: Bluetooth is a short-range wireless technology that can be used to track the location of devices that are paired with a Bluetooth device.

In this system we made use of various types of design concepts. These include:

- Mockups that demonstrate how the finished product looks without any interactive elements and include only basic elements. This was implemented using figma.
- Prototype that takes the mockup to the next level — it's an interactive version of the product, with internal links, playable videos, and more. This allows you to identify issues before the product goes live. This as well was done with the aid of figma.

6. Usability Testing:

We created prototypes to test and refine our design concepts. Our design concepts include a simple and intuitive interface for drivers to view passenger locations on a map, with clear markers indicating the location of each passenger. For passengers, we developed a user-friendly interface that allows them to easily toggle their location sharing preferences and view the location of other passengers on the map. We also incorporated features such as real-time updates to reduce waiting time for passengers.

- **Test Objectives:**

The objectives of usability testing were to evaluate the effectiveness of the design in meeting the user needs identified during the research phase, and to identify any areas for improvement. We developed specific test tasks that would allow us to evaluate the usability of the system and gather feedback from participants(Which was done among us).

- **Test Environment:**

We conducted the usability testing in a controlled environment to ensure consistency and accuracy in the results. We used a testing room equipped with a computer, and a mobile phone.

That is the design can be seen through the phone already

- **Analysis and Improvements:**

After conducting the usability testing, we analyzed the data collected and identified areas for improvement. Based on the feedback and observations, we made several design improvements, including simplifying the interface, adding more prominent location privacy controls. We also made adjustments to the user flows and user scenarios to ensure a more seamless user experience.

- **Iteration:**

We made the necessary design improvements based on the feedback gathered during the usability testing and conducted iterative testing to ensure that the new design was effective in meeting the user needs. We continued to iterate until we achieved a design that met the user needs and provided a satisfying user experience (Even though it is still in progress).

Overall, usability testing was a crucial step in the design process that allowed us to identify areas for improvement and ensure that the design met the user needs. By gathering feedback from participants and making iterative improvements, we were able to create a design that provides a seamless and satisfying user experience.

7. Final Design:

Following are a series of screenshots of the user interface design. The driver interface includes a map with markers indicating passenger locations, while the passenger interface features a map with clear options for location sharing and viewing other passengers.

Welcome back/login page:

Welcome back

Login



User Name:

Password:

☐ i am a **Driver**

Signup

Driver's registration page

Driver Registration

Full Name:

Driver's License:

Issuing Country/State:

License Expiration Date:

Identity Document:

No file chosen

Selfie with ID Document:

No file chosen

What Other Drivers are saying



I love how TripTrack enhances passenger safety. I feel confident knowing that only genuine passengers are using the service. It prioritizes the well-being of both drivers and passengers.



Its advanced features, such as real-time traffic updates and intelligent route suggestions, ensure that I can navigate smoothly and reach passengers without any delays.



As a driver using TripTrack, I am amazed by how efficiently it optimizes routes for passengers. It saves me valuable time and allows me to provide a seamless transportation experience.

TripTrack

Join us make movement easy for the world

Contact Information

Phone: 672944309

Email: innovation@triptrack.com

Address: molyko Street, Buea, Cameroon

Navigation

[Home](#)

[About Us](#)

[Driver](#)

[Services](#)

Connect with Us

[Facebook](#)

[Twitter](#)

[Instagram](#)

[LinkedIn](#)

© 2023 Triptrack. All rights reserved.

[Terms of Service](#)

[Privacy Policy](#)

Welcome to **Trip Track**

Signup



First Name:

Address:

Email:

Password

Signup

8. Implementation:

Based on the task at hand our system will firstly be a web app but then mostly accessed by tablets and phones. So, no matter the device you have you can use the system. With that been said we have the front end and the back end of our side, that is the front end is been implemented with HTML, CSS and JAVASCRIPT for the UI of the system and PYTHON as a language, DJANGO as a framework, and POSTGRESQL for the database.

Note should be taken that the design is first done on figma before being implemented.

9. Conclusion:

Overall, the UI/UX design of the passenger positioning system meets the needs of both drivers and passengers, with a focus on reducing waiting time and optimizing fuel usage. The system is designed to enhance the efficiency of ride-hailing services and improve the overall user experience for both drivers and passengers. Future iterations of the system could include additional features such as route optimization, integration with other transportation services, solve the problem of a user not having a car because he or she is alone, and the situation of deadlock(traffic) since all drivers want to go to places where they are more passengers to further improve the efficiency of the system.