

User-Centered Design CSP 588

Homework – 3

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Tools Used for UI/UX: Figma

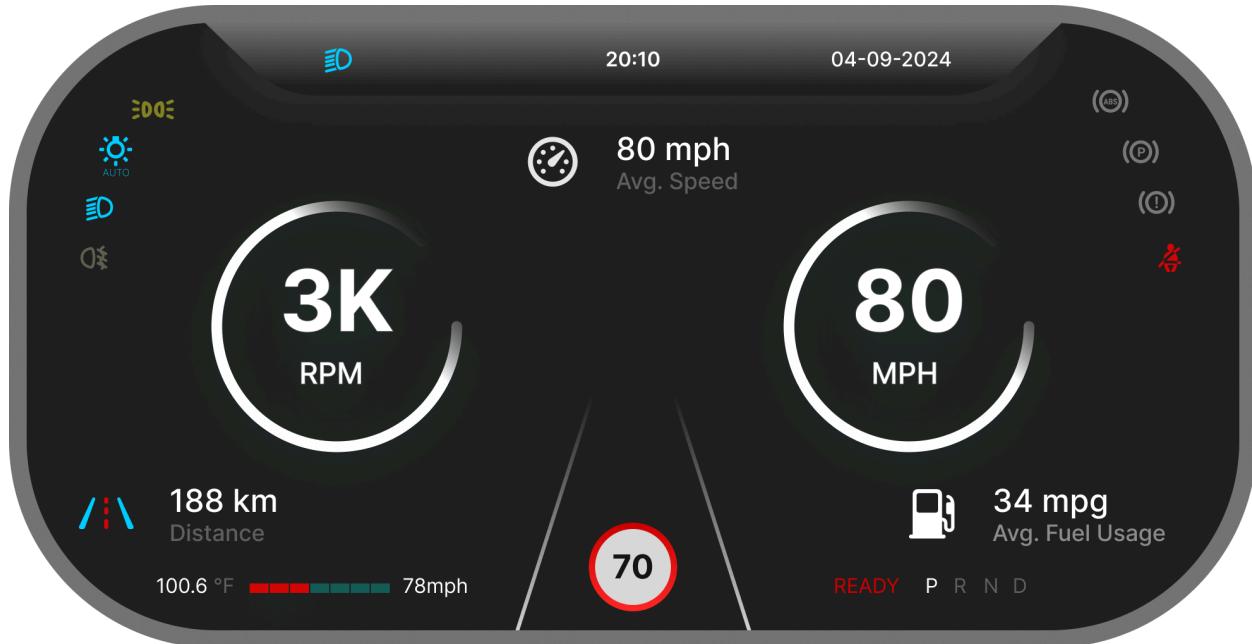
Tool Used for Prototype Sketch: Wireframe pro

URL for Over Design and UI: www.figma.com/file/4VFgs2YaQ5vjoVVlyTPQS4/UCD-HW3

UX design for human-driven cars:

1. Design an optimal UX for the driver

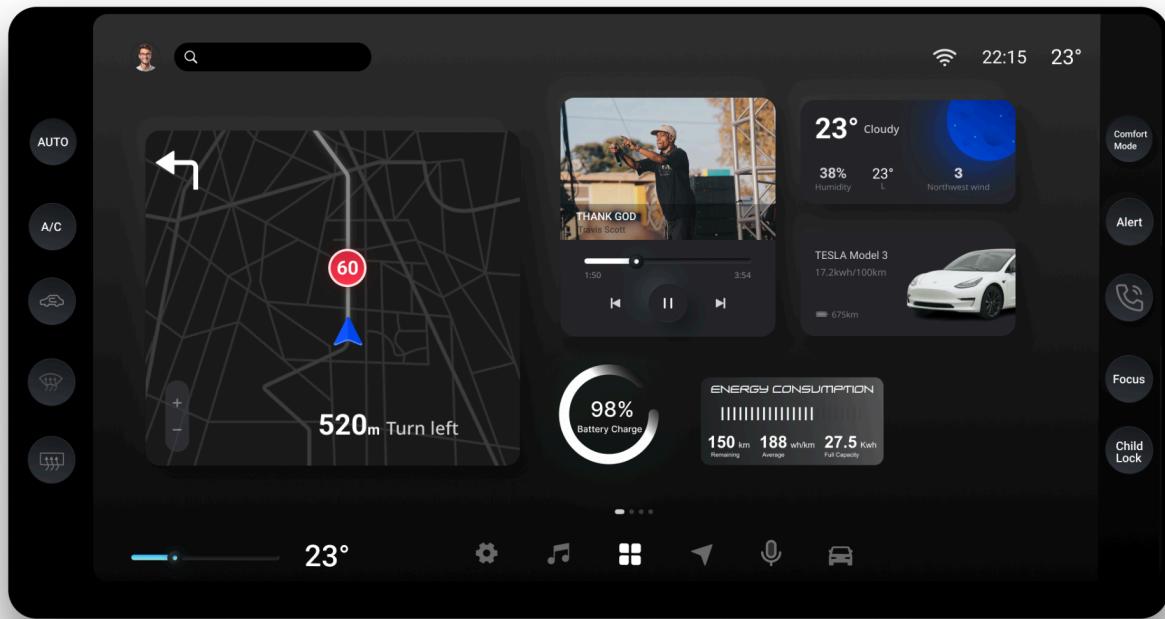
The two dashboard UX designs, which address different aspects of the driving experience, offer an understanding approach to the driver interface in human-driven cars:



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Dashboard UX 1 focuses on driving essentials with large, easy-to-read gauges for speed and RPM, complemented by discreet indicators for other vital car functions. This prioritization of key driving information aims to reduce distraction and driver discomfort.

Dashboard UX 2 provides a modern information technology interface that divides convenience and connectivity features into separate, simple-to-access zones. In order to reduce driver interaction time and increase convenience and safety, touchscreen controls for climate and media are included.



www.figma.com/file/4VFgs2YaQ5vjoVWlyTPQS4/UCD-HW3

a) Describe pain points: discomfort, fatigue, and 1 more

The major Pain Points of a driver while driving are :

Discomfort: This can arise from physical strain due to poor ergonomics, such as uncomfortable seating, awkward placement of pedals, or controls that require too much reach. Additionally, visual discomfort can occur from poorly designed instrument clusters that are difficult to read or interfaces that require too much attention to navigate.

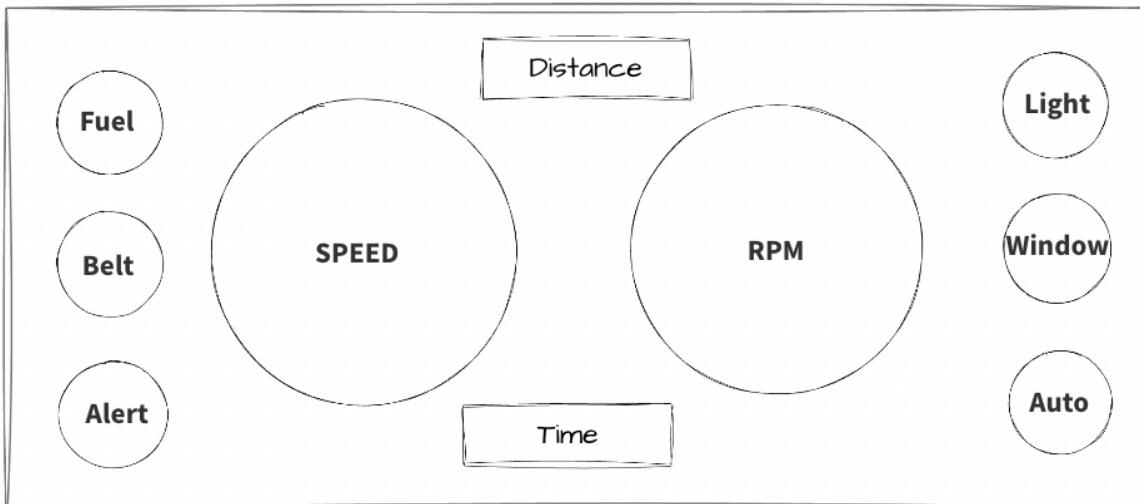
Fatigue: Often results from prolonged periods of concentration, monotonous road conditions, or the need to constantly interact with complex systems. It can also stem from the mental effort required to process a large amount of information presented on the dashboard or navigation systems.

Distraction: One of the most important pain points is distraction, which can be caused by infotainment systems that are too complex, an excessive number of buttons, or multipurpose displays that divert the driver's attention from the road.

b) Sketch displays of information to address pain points

Dashboard 1: This dashboard's design places a strong emphasis on simplicity and clarity in order to directly address the **pain points**. Large, central gauges that are easy to read help reduce eye strain and **cognitive fatigue** by providing the speed and RPM information. The secondary purpose of the seatbelt, fuel, and alert peripheral indicators is to support safety without overpowering the driver and **reduce distraction**.

Dashboard 1

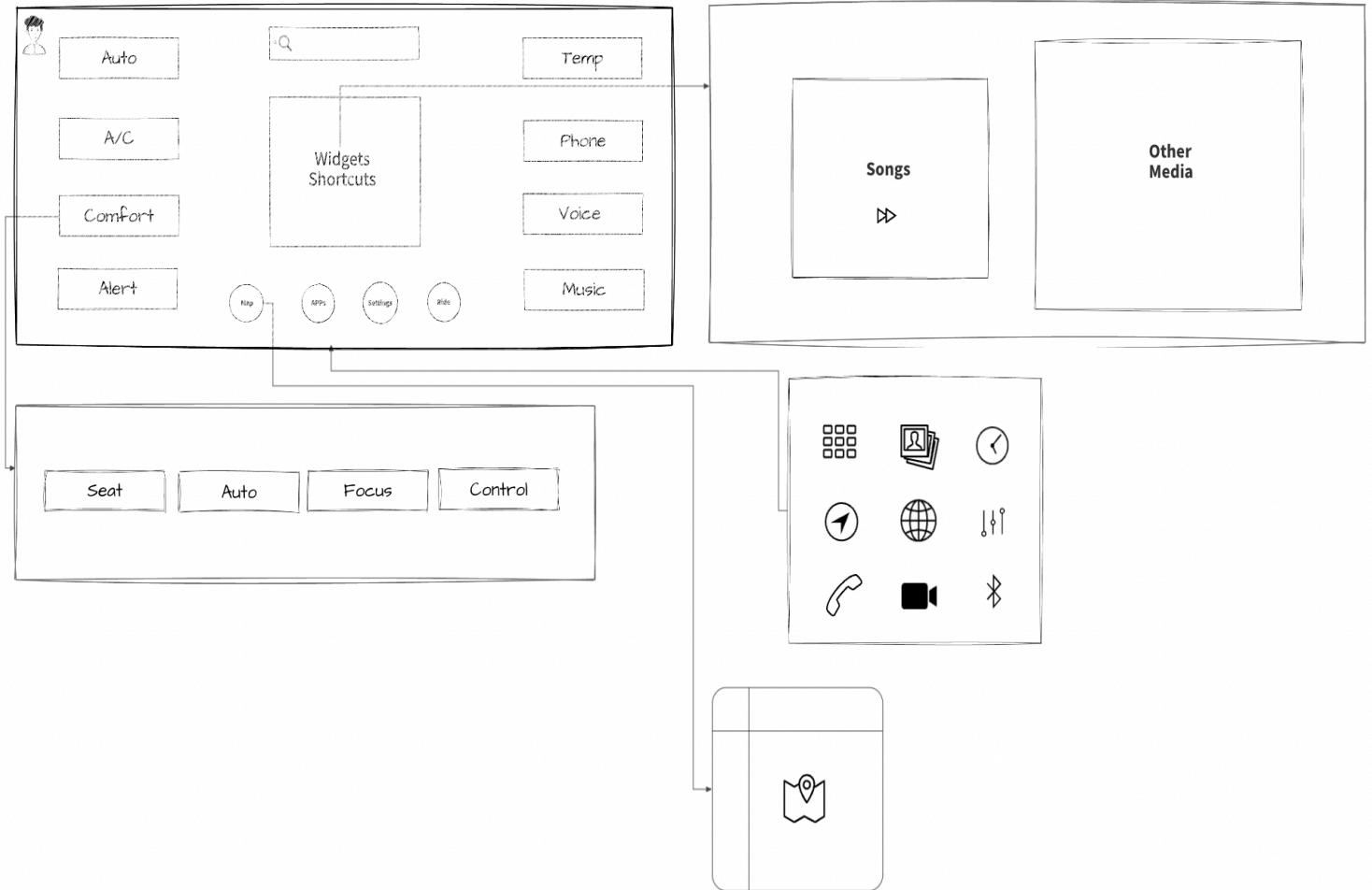


- **Clarity:** By using large gauges that are simple to read at a glance, the speedometer and tachometer serve as the focal points and lessen the visual strain that can result from having to search for this important information while driving.
- **Simplicity:** Smaller and side-positioned secondary information is displayed, such as the fuel level, seatbelt status, and alerts. This makes the dashboard layout simpler, which helps the driver absorb crucial information without feeling overloaded and reduce cognitive fatigue.
- **Safety Alerts:** To help ensure safety without causing distraction, indicators for safety-critical alerts (such as the seatbelt warning) are immediately visible without taking up much space on the display.

Dashboard 2: With a clear division between vehicle controls and entertainment, features are arranged logically in this infotainment-focused dashboard. **Comfort** is increased by the design, which makes touchpoints simple to interact with. While keeping entertainment options away from the main vehicle controls helps **reduce distraction**, ergonomic control arrangement addresses cognitive fatigue.

- **Functional Grouping:** Media, climate, and vehicle controls are all logically arranged into separate zones. This focused grouping reduces discomfort by simplifying the location and operation of controls and reducing confusion.
- **Easy Interaction:** The large and uncomplicated touch targets for interactive elements such as media and climate alleviate the physical strain and mental strain of using them, thereby addressing fatigue.
- **Entertainment Separation:** By clearly separating the areas of the driver's attention that need to be focused on driving duties from those that are for entertainment, the media controls and the vehicle controls are placed visually apart, reducing distraction.

Dashboard 2



c) Describe driver controls/inputs to address pain points

Based on the above UI/UX and Prototype, we can conclude the following factors that address the major pain points :

Key driving features are managed via direct-access hard buttons and switches (e.g., Light, Auto features), which are reliable and less distracting to operate while driving.

Secondary features like media and climate control are accessible through the touch-screen interface, designed with sizable touch targets to minimize the precision needed, thereby reducing cognitive and manual strain.

The ease of use :

Physical discomfort is minimised by controls that are easily accessible and demand little effort.

Drivers can adjust frequently used steering wheel controls (like cruise control and volume) without having to stretch or take their eyes off the road.

Intuitiveness:

Commonly used functions have dedicated, clearly labelled buttons or switches. Touchscreens employ familiar gestures and large touch areas to minimize the need for precise, attention-diverting interactions.

Simplicity:

The layout is straightforward, with controls grouped by function to reduce cognitive load.

Avoid multifunction buttons that can lead to confusion and increase the time to locate the desired function.

Accessibility:

Voice-activated controls reduce discomfort and distraction by enabling drivers to maintain both hands on the wheel and eyes on the road.

Drivers of all shapes and sizes should be able to reach the controls, which should also be able to be adjusted in position as needed.

Reduce Distraction:

Important data, like speed and navigation, are projected onto the windshield by heads-up displays so that drivers can see it.

Prioritising and developing critical alerts that draw attention without causing panic are important.

d) Assess the driver's UX w.r.t. the pain points

- **Discomfort:**

Are the displays easy to read without straining the eyes?

- Large, clear fonts and intuitive icons help prevent visual discomfort.

Are the controls ergonomically placed? Controls that are within a natural reach and require minimal effort to use can prevent physical discomfort.

- **Fatigue:**

Does the system reduce the amount of mental strain?

By simplifying the process of processing information, a logically laid out and well-organized dashboard can help prevent mental fatigue.

Are you having efficient interactions with the system? Simplified menus, voice commands, and quick, responsive controls can all help minimise fatigue by cutting down on the amount of time and mental strain needed to complete tasks.

- **Distraction:**

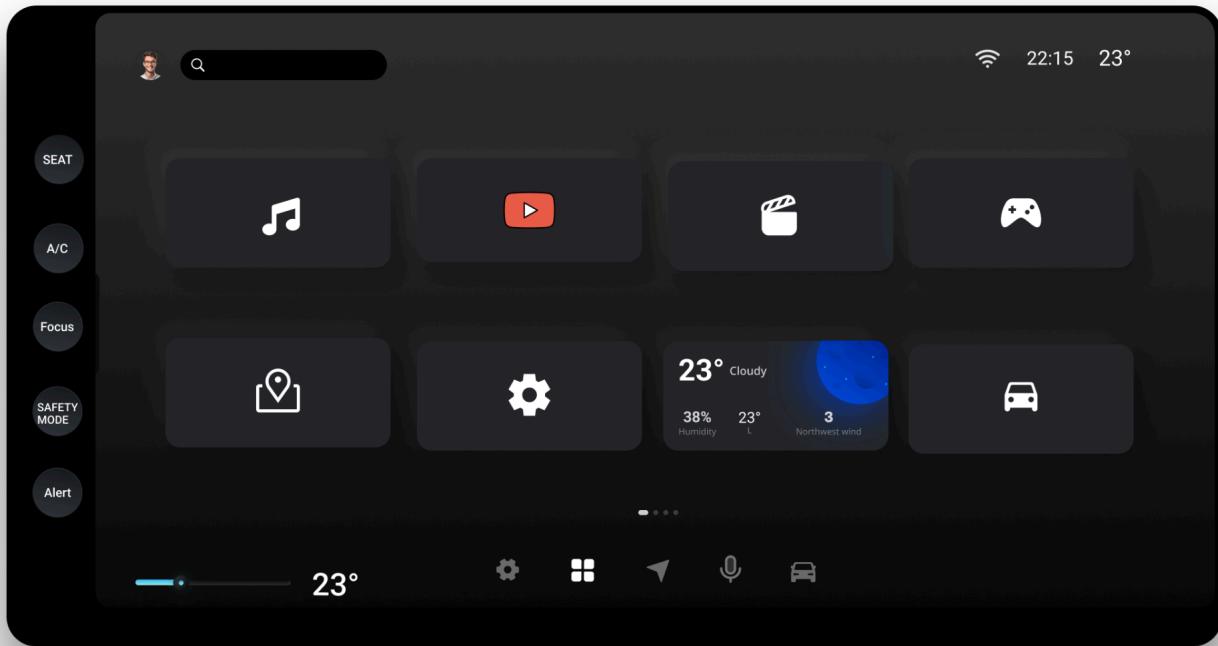
Are the most critical driving-related displays prioritized?

To reduce the amount of time a driver must take their eyes off the road, crucial information such as speed and navigation should be displayed most prominently.

Are features that aren't necessary and entertaining made so they don't compete for users' attention? Driving should not be interfered with by secondary systems. For example, audible confirmation of commands executed successfully can serve as a substitute for visual confirmation of actions.

2. Design an optimal UX for a passenger

Following is the optimal UX design for Passengers inside the car



www.figma.com/file/4VFgs2YaQ5vjoVllyTPQS4/UCD-HW3

a) Develop a user persona for the typical passenger

Following is the **User Persona** of the passengers in general who are travelling from **one spot A to another spot B** and experiencing the inner and outer environment of the Car including the **UX, infrastructure, and Functions of the Car.**

- **Travel Preferences:**
depends on ride-sharing for occasional leisure trips, business travel, and daily commutes appreciates being on time and wants a precise travel time estimate

May utilise travel time for productive tasks (like work-related tasks) or recreational activities (like gaming or reading)

- **Comfort Level Preferences:**

Emphasizes providing a comfortable riding and seating environment, which includes space and temperature control.
prefers a customised in-car experience, with features like streaming services and personalised music playlists

- **Technological Proficiency:**

Comfortable using a range of apps and services on mobile devices
Prefers digital solutions for day-to-day activities

- **Goals:**

To effectively and swiftly handle travel plans
To experience a customised and cosy travel experience To stay connected and informed throughout the journey without needless complexity

b) Describe pain points: boredom, uncertainty, and 1 more

- **Boredom**

During their travels, passengers frequently encounter boredom, particularly when taking well-known or uninteresting routes, which can make the trip seem longer and more exhausting.
A boring trip can be caused by a lack of interesting things to do or places to go for entertainment.

- **Uncertainty**

Anxiety can arise when one is unsure of their accurate arrival time, particularly when travelling to an immediate appointment.
A feeling of unpredictability may be heightened by worries about service consistency, such as driver professionalism and car comfort levels.

- **Discomfort:**

Physical discomfort can arise from inadequate climate control, unsatisfactory seat ergonomics, or a noisy environment.

A lack of control over the in-car experience, such as being unable to choose music or engage in preferred leisure activities, can lead to a sense of restlessness and dissatisfaction.

Addressing these pain points involves creating an in-vehicle experience that is entertaining, informative, and comfortable, ensuring that passengers feel at ease, engaged, and in control of their journey.

Assessment of these pain points is discussed and illustrated in the UX and section d)

c) Storyboard the passenger environment/experience

Getting inside the car

When the passenger opens the car door, they find a clean welcoming interior. Their name is added to a personalised welcome message that appears on the in-car display.

Customising the Setting

By pressing the 'SEAT' button on the touch panel, they can automatically set her seat to a preferred position. They swipe the screen to change the 'A/C' settings to their preferred temperature.

Choosing Entertainment

The passenger taps the music note icon to choose her preferred playlist to stay entertained. Then, using well-known app icons to navigate streaming services, they look for a video to watch while driving.

Maintaining Information

The map-based in-car system displays passengers' current location. They look at the weather widget on the screen, making note of the temperature and weather and other information accordingly.

Productivity While Travelling

By choosing the 'Focus' mode on the touch panel, passengers can reduce noise and dim the lights, which makes it a more comfortable place for them to work.

Comfort Adjustments

Midway through the trip, the passengers start to get a little cold. They use a user-friendly interface to easily change the temperature.

Preparing to Arrive

The passenger gets an alert as the car gets closer to their destination. Arriving at the destination, they begin to pack things.

Getting Out of the Car

The car pulls up to its destination. The passenger gets out of the vehicle, feeling rejuvenated and satisfied with the smooth, cosy ride made possible by the intelligent UX design of the vehicle.

This storyboard illustrates the ideal traveller experience, complete with an easy-to-use user interface for personal comfort, entertainment, information, and productivity.

d) Assess the passenger's UX w.r.t. the pain points

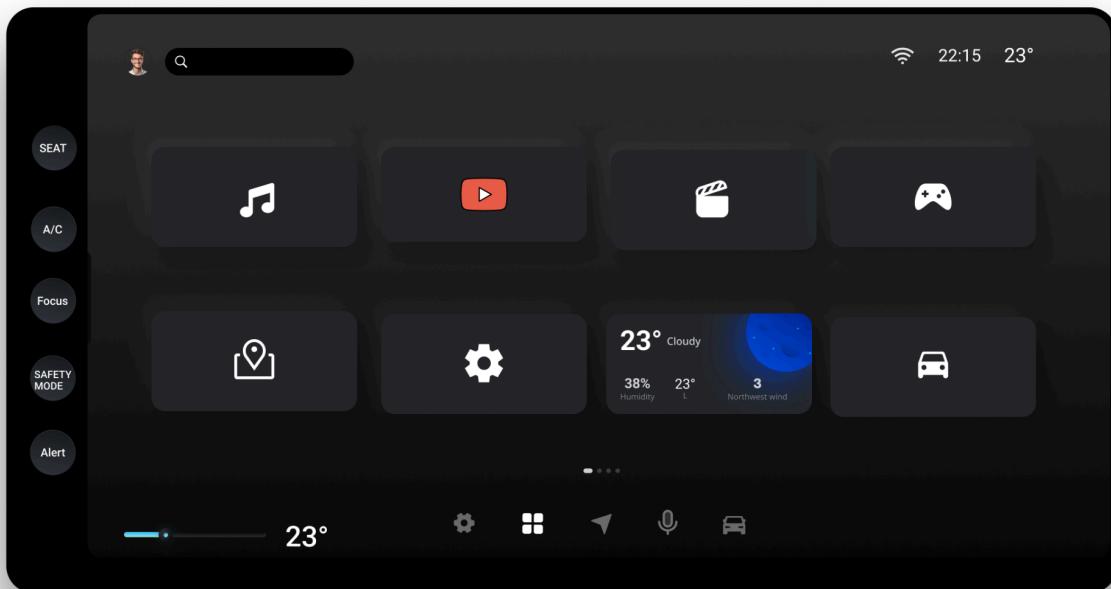
Boredom

- Through easily recognisable icons, the interface provides a range of entertainment options, including music and video streaming, that can keep passengers entertained and break up the boredom of travel.
- The option to play games implies that interactive content is available, offering a fun way to spend time.

Uncertainty

- Passengers can reduce their anxiety related to uncertain weather conditions by planning ahead of time with the help of the weather widget, which offers real-time weather information.

- Passengers can track their progress and route using a GPS or location icon, which provides reassurance about the trip and the expected time of arrival.



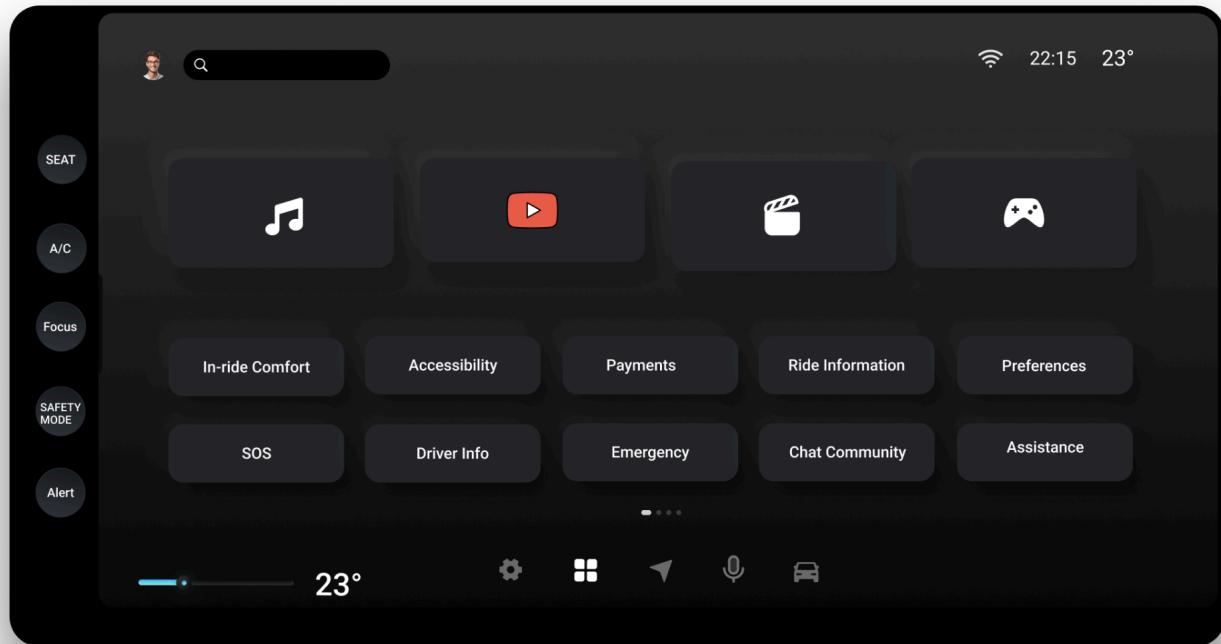
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Discomfort:

- Passengers' physical discomfort can be addressed by customising their immediate environment according to their preferences through the use of seat adjustment and climate control controls.
- Concerns about one's security during the trip may be resolved by safety features like a designated "Safety Mode" and "Alert" systems, which probably provide information on safety precautions and updates.

3. Design an optimal UX for a passenger in a ride-share

The optimal UX for a Passenger in a ride share with all the major and essential functionalities is illustrated in the following UX :



www.figma.com/file/4VFgs2YaQ5vjoVllyTPQS4/UCD-HW3

a) Distinguish from #2's experience using pain points

1. Community Engagement:

The 'Chat Community' feature is designed to address potential social isolation during shared rides by providing a platform for passengers using ride-sharing services to interact with other users.

2. Confidence in Safety:

Because there is a greater need for safety in shared vehicles, a prominent 'SOS' button is provided. This particular ride-sharing pain point arises from the presence of strangers.

3. Transparency of Drivers:

Details about the driver are provided by "Driver Info," which is crucial in ride-sharing situations where drivers and passengers must build trust right away.

4. Payment Convenience:

The interface incorporates a 'Payments' feature that addresses the challenge of managing transactions in shared rides, which may involve split fares or distinct payment methods.

5. Options for Accessibility:

Improved 'accessibility' features are essential in ride-sharing, since users with different needs—from those who require visual or auditory assistance to those who have mobility challenges—must be accommodated.

6. Customising the Riding Experience:

It is a pain point in ride-sharing when settings are frequently a compromise between different passengers' preferences. 'Preferences' and 'In-ride Comfort' options allow passengers to customise the shared environment to their liking.

7. Immediate Support:

Immediate assistance is available through a 'Assistance' button, which tackles the challenge of problem-solving while driving or supervising several passengers.

8. Informed Journey:

'Ride Information' gives real-time updates on the trip, essential for planning in a shared context where routes and drop-offs may vary from ride to ride.

b) Describe an innovative experience and assess UX

Innovative Experience: Co-ride Customisation

Feature Description: "Co-ride Customisation" allows riders to choose their preferred music selections, shared environment settings, and ambient noise levels before the start of the ride. Passengers input their preferences into the app when making a ride reservation. Then, if there is a mix of preferences, the system finds a compromise by matching riders with similar preferences.

The car's system instantly modifies the surroundings to the group's pre-configured preferences once it is inside the ride-share. This could be a playlist put together from the passengers' preferred genres, seat adjustments, and climate control.

Assessment of UX:

User Empowerment: This feature allows users to customise and personalise their ride experience by giving them control over their surroundings, even when they are in a shared space.

Efficiency: By indicating their preferences ahead of time, travellers can save time and save themselves the uncomfortable experience of having to compromise with other passengers while travelling.

Compatibility: It enhances the feature set without overcrowding the interface by integrating easily with pre-existing UX elements such as "Preferences" and "In-ride Comfort."

Social Harmony: By guaranteeing that everyone agrees with the surroundings in advance, it may lessen disputes amongst riders and promote a more agreeable social dynamic.

Security and privacy: To protect privacy, the feature needs to make sure that individual preferences aren't disclosed to other travellers.

