AR Smart Navigation Glasses for Seamless Urban Mobility

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Project Brief

Design an interaction for a Futuristic Technology that will be used in the next 2 years. Research the evolving needs and expectations of consumers across mobile devices, accessories, etc

Two approaches –

- **Scenario-Based** - Identify a need for better interaction in specific scenarios (e.g., using mobile devices while driving).

- **Product-Based** - Improve interaction for products that don't function well in certain situations.

Scenario

People walking or cycling in a new city struggle to look at maps on their phones– it's distracting, unsafe, and breaks the experience of exploring.

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01

Discover

Introduction

In the age of rapid tech evolution, users demand seamless, intuitive interactions – even while navigating the world around them.

But current mobile and map-based solutions often fail in real-life scenarios like:

- Driving or walking in crowded areas.
- Staying oriented without breaking focus.
- Handling devices in rain, heat, or carrying luggage

*This project explores the **future of interaction design** through a product that merges **Augmented Reality (AR)** and **wearable technology**, envisioning a solution just **2 years ahead** of today.*

Existing Products

Google Maps

Google Maps is a **navigation app** offering **real-time directions**, but depends on **manual smartphone interaction**.

Ray-Ban Meta

Ray-Ban Meta offers **hands-free features** and **Meta AI**, but lacks **AR navigation** capabilities.

Apple Vision Pro

Apple Vision Pro provides **immersive AR/VR experiences**, mainly for **entertainment**, not **navigation on-the-go**.

Feature Analysis

Features	Google Maps	Ray-Ban | ∞ Meta	Apple Vision Pro
Hands-free nav	❌	✅	✅
Gesture control	❌	❌	✅
Glanceable AR UI	✅	⚠️	✅
Comfort & usability	⚠️	✅	❌
Voice control	✅	✅	✅

✅ Have   ❌ Don't have   ⚠️ Limited

Google Maps Live View – SWOT

STRENGTHS

- Familiar interface.
- Widely used globally.
- Accurate AR navigation.

WEAKNESSES

- Needs hand use.
- High battery drain.
- Poor in crowd/low light.

OPPORTUNITIES

- Voice/Gesture support.
- Smart glass integration.
- City-based enhancements.

THREATS

- UX fatigue.
- Privacy concerns.
- Wearable AR rivals.

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Ray-Ban Meta Glasses – SWOT

STRENGTHS

- Stylish design.
- Voice assistant.
- Hands-free camera.

WEAKNESSES

- Audio leakage.
- Limited AI context.
- No real-time nav UI.

Ray-Ban | ∞ Meta

OPPORTUNITIES

- Context-aware AI.
- Add AR nav overlay.
- Expand travel features.

THREATS

- Privacy backlash.
- Gesture limitations.
- Competitor AI wearables.

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Apple Vision Pro – SWOT

STRENGTHS

- Powerful hardware.
- High-end immersive AR.
- Precision gesture control.

WEAKNESSES

- Expensive.
- Not portable.
- Heavy for long use.

 Vision Pro

OPPORTUNITIES

- Better social UX.
- Paired device navigation.
- Lighter travel-focused model.

THREATS

- Market resistance.
- Social unacceptability.
- Health risks (eye strain).

Competitor Analysis

Key Takeaways

- **Google Maps Live View** is accurate but fails in hands-free usage and crowded environments.

- **Ray-Ban Meta** offers hands-free photo/audio but lacks smart navigation overlays and contextual guidance.

- **Apple Vision Pro** provides immersive AR, but it's bulky, expensive, and not made for real-world travel use.

Conclusion:

A clear gap exists for **lightweight**, **hands-free AR glasses** that support **real-time**, **context-aware navigation** for urban and travel use without compromising comfort or privacy.
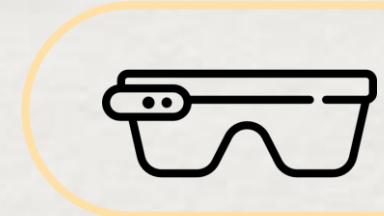
Tech Trends (2025–2027)

AR Smart Glasses are Going Mainstream

Market Growth:

- Global smart glasses market expected to hit **$21.4 billion** by **2025**.
- Major brands investing: **Apple**, **Meta**, **Google**, **Xiaomi**, **Oppo**, **Samsung**.

Tech Advancements:

- Transparent AR displays (lightweight, high-contrast in sunlight)
- Compact processors built into frames (no bulky hardware)
- Long-lasting batteries & wireless charging
- Voice + gesture + eye-tracking input methods

Why It Matters:

This suggests that design can now consider everyday users, not just developers or early adopters. Augmented reality glasses may soon be worn casually in public.

01

Tech Trends (2025–2027)

Gesture & Eye Tracking Becoming Standard

- Apple Vision Pro and Meta Quest already use **eye + hand tracking**
- Sony and Tobii developing **gaze-based interfaces**
- Hands-free control is perfect for walking, running, or cycling

Types of Gestures can be use:

👁 Eye focus = select

🙂 Head nod = confirm

😑 Blink or squint = tap

👀 Look left/right = scroll or switch view

Why It Matters:

This introduces a new mode of interaction, which can be especially useful in situations like travel, where touch and voice may not always be practical.

02
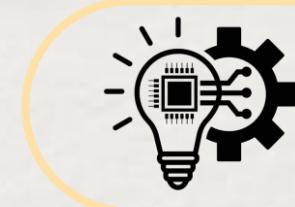
Tech Trends (2025–2027)

Context-Aware AI in Real-Time

- AI can now read context (e.g., if you're walking fast, on stairs, in sunlight)
- Smart systems adapt UI based on user behavior and surroundings
- Example: "Auto-hide UI when you're in bright light," or "Alert for detours"

Why It Matters:

Rather than simply displaying directions, the system intelligently adapts guidance to each user's individual journey.

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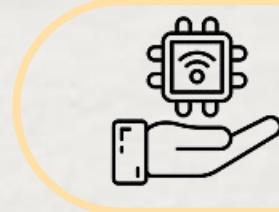
Tech Trends (2025–2027)

Miniaturization & Style

- Early AR glasses were clunky. New ones look like regular Ray-Bans or Oakleys.
- Lightweight materials, foldable arms, stylish designs.
- 2026–2027 is the "style + utility" phase of wearables.

Why It Matters:

The design is intended to integrate seamlessly into daily wear, functioning as both a stylish accessory and a highly practical tool.

04

User Pain Points

- **AI assistants** (like Meta AI) are too **basic** for real-time **contextual support**.

- **Built-in cameras** make people around feel **uncomfortable**.

- **Battery lasts only 3–3.5 hours** with **active use**.

- **Displays** (like in ENGO 2) block **central field of view**.

- **Glasses slip** during **intense motion** like running or biking.

- **Head gestures** or **swipes** often don't **register properly**.

- Long use causes **headaches**, **eye strain**, even **burst eye vessels**.

Primary Research Questions

- How often do you use Google Maps or any navigation app?
- In what situations do you usually rely on navigation?
- Do you face any difficulties while navigating unfamiliar places?
- Have you ever missed a turn or gotten confused using your phone for navigation?
- Does holding your phone while navigating feel uncomfortable or unsafe?
- Have you experienced issues like screen glare, battery drain, or lag in GPS?
- Have you used any wearable tech like smartwatches, fitness bands, or smart glasses?
- Would you be open to using smart glasses that help you navigate hands-free?
- What concerns would you have using AR glasses in public?

Primary Research Insights

- Most participants said they use Google Maps **almost daily**, especially while **walking in unfamiliar areas**, **traveling alone**, or **driving in new cities**.
- **Holding the phone** was often seen as annoying, especially while walking, driving, or when carrying things.
- Users mentioned **missing turns** or **delayed voice prompts** which caused confusion.
- Many reported **screen glare** in sunlight and **battery drain** as regular issues.
- About half the participants had used **smartwatches** and **fitness bands**, but **none had tried AR glasses** yet.
- Majority were **excited** about the idea of **hands-free navigation** via AR glasses.
- Users preferred something **lightweight**, with **simple UI**, and **voice/gesture controls**.
- Top concerns of people include:
    - **Privacy & camera** misuse.
    - **Battery backup** and **comfort** for long usage.
    - **Social awkwardness** while wearing them in public.

02

Define

Bio:

Ayush is a full-time software engineer working at an IT firm in Pune. He frequently travels for work and leisure, often exploring new places on weekends. He's a tech-savvy person who uses smart gadgets daily but finds it annoying to rely solely on his phone for everything.

Goals:

- Explore and move around confidently in new cities.
- Avoid distractions while navigating.
- Use a lightweight device that doesn't demand hand usage.
- Adopt futuristic technology that's practical in daily life

Frustrations/Pain Points:

- Holding the phone while walking or riding feels unsafe and inconvenient.
- He often misses turns due to slow map feedback.
- Bright sunlight makes screen visibility poor.
- GPS lags and constant battery drainage during navigation.
- Public use of phone while walking makes him feel awkward

Tech Comfort Level:

Very high, open to trying smart glasses or any wearable tech if it solves a real problem

Ayush Sharma

Age	:	27
Occupation	:	IT Professional
Location	:	Pune, Maharashtra
Income	:	₹10 - 15 LPA
Education	:	B.Tech in Computer Science

Using the phone while walking feels unsafe and awkward.

Sometimes I miss turns even when I'm following the map.

Is there a better way to get real-time directions without pulling out my phone?

I hate depending on the phone screen all the time.

I wish there was something more convenient and hands-free.

AR glasses could be cool, but will people stare at me?

Says

Thinks

Does

Feels

Frequently checks phone while walking in new areas.

Frustrated when he has to stop mid-way just to check directions.

Adjusts phone angles due to sunlight glare.
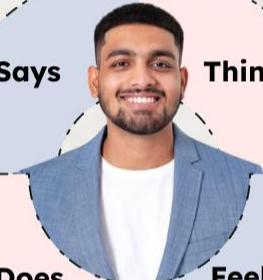
Curious and slightly excited about future tech like AR glasses.

Anxious about missing turns or walking the wrong way.
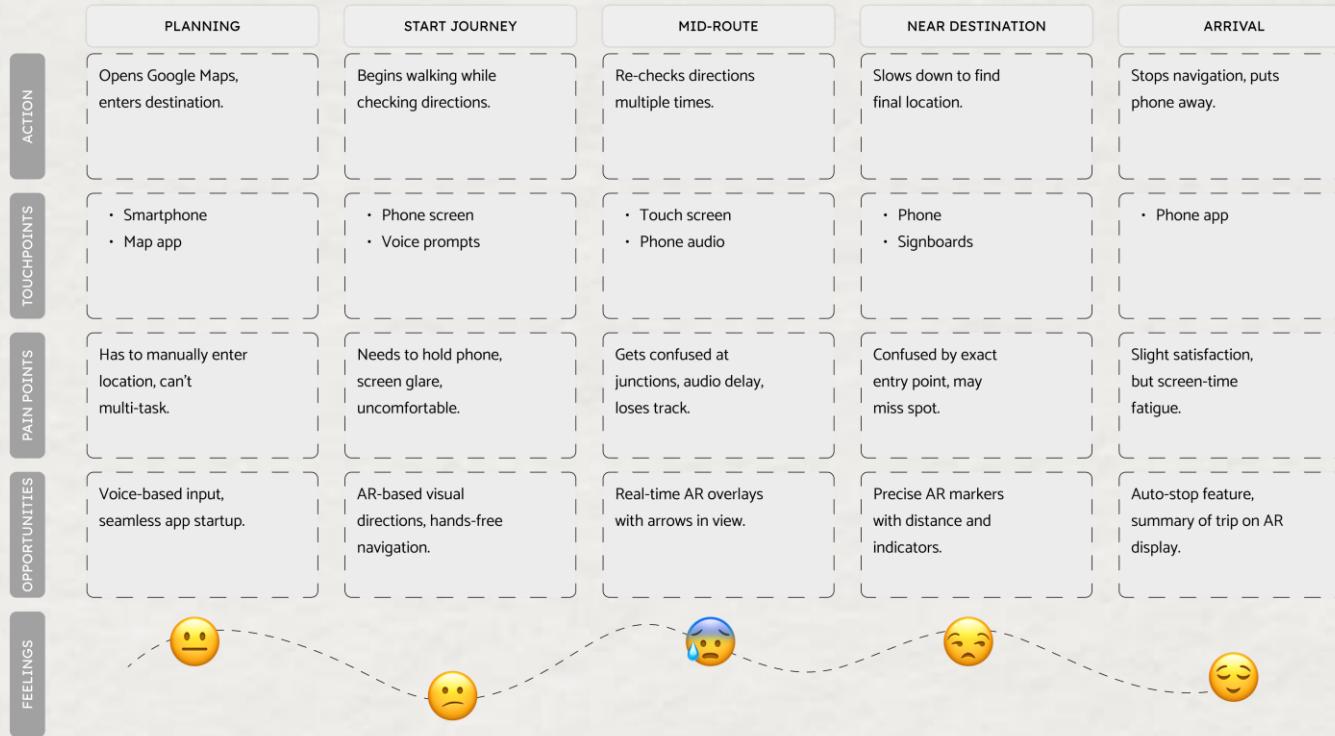
Curious and slightly excited about future tech like AR glasses.

Customer Journey Maps (as is)

Scenario:

Ayush walks to a new café using Google Maps, facing navigation issues amid traffic and busy streets.

	PLANNING	START JOURNEY	MID-ROUTE	NEAR DESTINATION	ARRIVAL
ACTION	Opens Google Maps, enters destination.	Begins walking while checking directions.	Re-checks directions multiple times.	Slows down to find final location.	Stops navigation, puts phone away.
TOUCHPOINTS	• Smartphone • Map app	• Phone screen • Voice prompts	• Touch screen • Phone audio	• Phone • Signboards	• Phone app
PAIN POINTS	Has to manually enter location, can't multi-task.	Needs to hold phone, screen glare, uncomfortable.	Gets confused at junctions, audio delay, loses track.	Confused by exact entry point, may miss spot.	Slight satisfaction, but screen-time fatigue.
OPPORTUNITIES	Voice-based input, seamless app startup.	AR-based visual directions, hands-free navigation.	Real-time AR overlays with arrows in view.	Precise AR markers with distance and indicators.	Auto-stop feature, summary of trip on AR display.
FEELINGS	😐	🙁	😰	😒	😌

Problem Statement

Urban users face difficulties navigating **unfamiliar places** using phones due to **screen glare**, **battery issues**, and **unsafe hand usage**.
Current navigation isn't **hands-free** or **seamless**.
There's a need for a **futuristic**, **wearable AR solution** that provides **intuitive**, **real-time directions** without distracting users from their **surroundings**.

How Might we Statements

Make navigation truly hands-free and distraction-free?

Use AR to improve real-time navigation for pedestrians?

Make navigation more intuitive than following a phone screen?

Help users focus on their surroundings while staying informed?
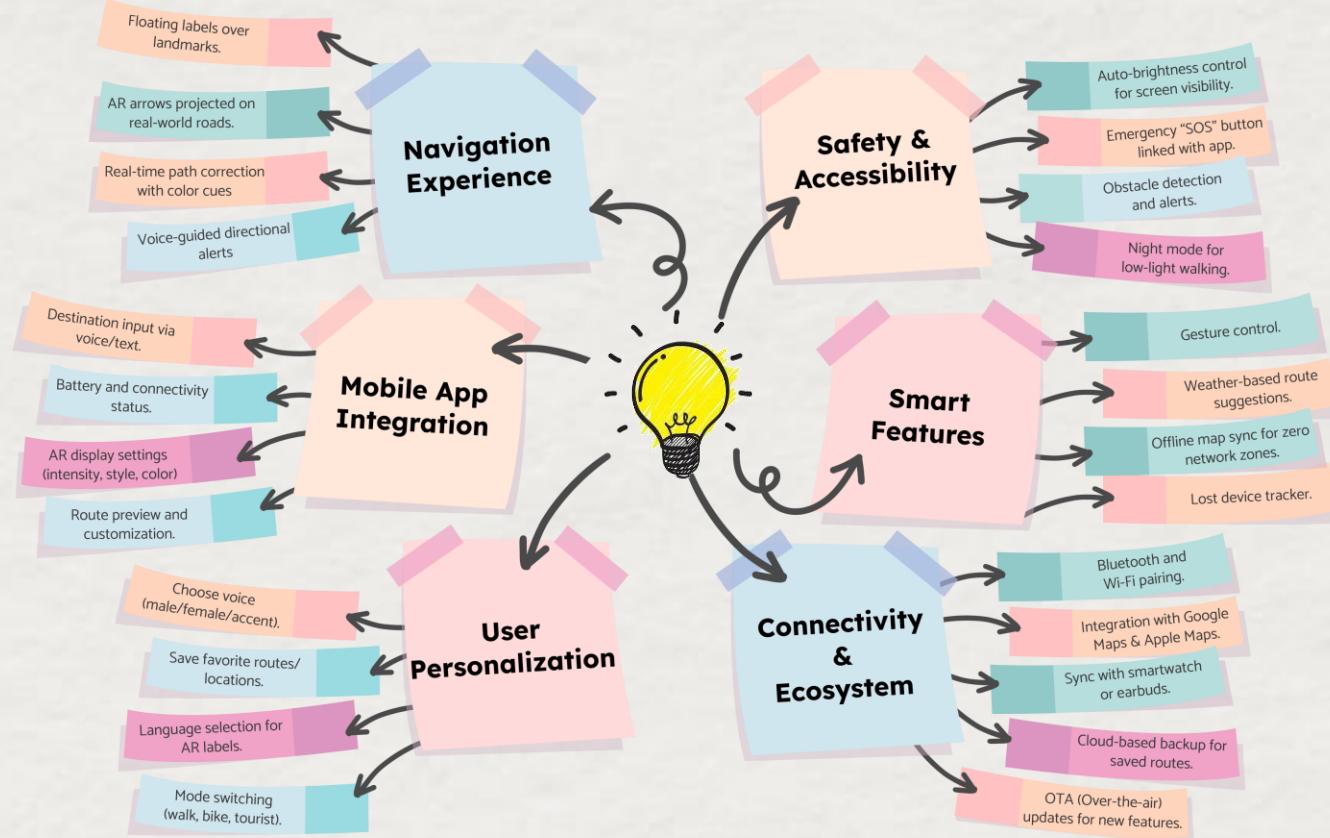
Ensure safe and confident navigation in unfamiliar places?

03

Dream

Brainstorming

Navigation Experience
- Floating labels over landmarks.
- AR arrows projected on real-world roads.
- Real-time path correction with color cues
- Voice-guided directional alerts

Safety & Accessibility
- Auto-brightness control for screen visibility.
- Emergency "SOS" button linked with app.
- Obstacle detection and alerts.
- Night mode for low-light walking.

Mobile App Integration
- Destination input via voice/text.
- Battery and connectivity status.
- AR display settings (intensity, style, color)
- Route preview and customization.

Smart Features
- Gesture control.
- Weather-based route suggestions.
- Offline map sync for zero network zones.
- Lost device tracker.

User Personalization
- Choose voice (male/female/accent).
- Save favorite routes/locations.
- Language selection for AR labels.
- Mode switching (walk, bike, tourist).

Connectivity & Ecosystem
- Bluetooth and Wi-Fi pairing.
- Integration with Google Maps & Apple Maps.
- Sync with smartwatch or earbuds.
- Cloud-based backup for saved routes.
- OTA (Over-the-air) updates for new features.

Technology Integration

Augmented Reality (AR)

Directions — Overlay arrows
Contextual navigation — Landmarks

Cloud Services & OTA Updates

Data Storage
Software Updates

Gesture Detection

Gesture Recognition
User Interaction

GPS + IMU Sensors

Location Tracking
Motion Sensing

Voice Assistant Integration

Voice Commands
AI Processing

Bluetooth / Wi-Fi Connectivity

Device Pairing
Internet Access

Mobile Companion App

User Interface
Device Control

Feasibility

Hardware Feasibility 🛠️

- **AR smart glasses** already exist in early forms.
- Components like **AR lenses, mini projectors, bone-conduction speakers,** and **IMU sensors** are actively improving and becoming more compact.
- Within 2 years, this product could become lightweight, affordable, and stylish enough for mass adoption.

Software Feasibility 🖥️
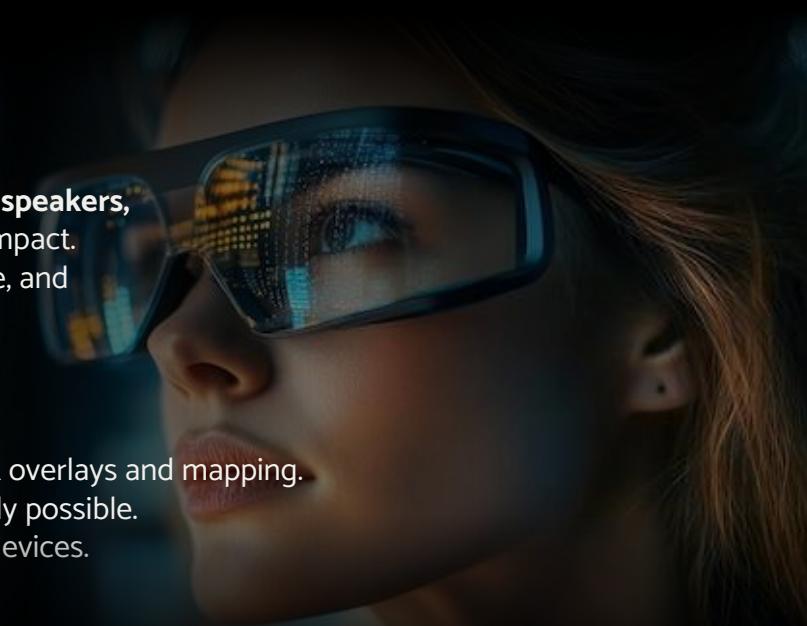
- **AR SDKs** like Google ARCore, Apple ARKit, and Unity support AR overlays and mapping.
- Integration with **Google Maps API** and **voice assistants** is already possible.
- Gesture and voice-based controls are being tested in newer XR devices.

Connectivity Feasibility 📡

- Seamless **Bluetooth 5.0 / Wi-Fi Direct** integration with mobile apps is stable.
- Cloud backups and OTA (over-the-air) updates are standard today.

Viability

- The **AR wearable market is growing rapidly** – expected to reach $12B+ by 2027.

- Users want **safer, distraction-free navigation** while walking or cycling, especially tourists, commuters, and delivery riders.

- Monetization through premium features, device sales, and partnerships with mapping apps (Google, Apple) is highly possible.

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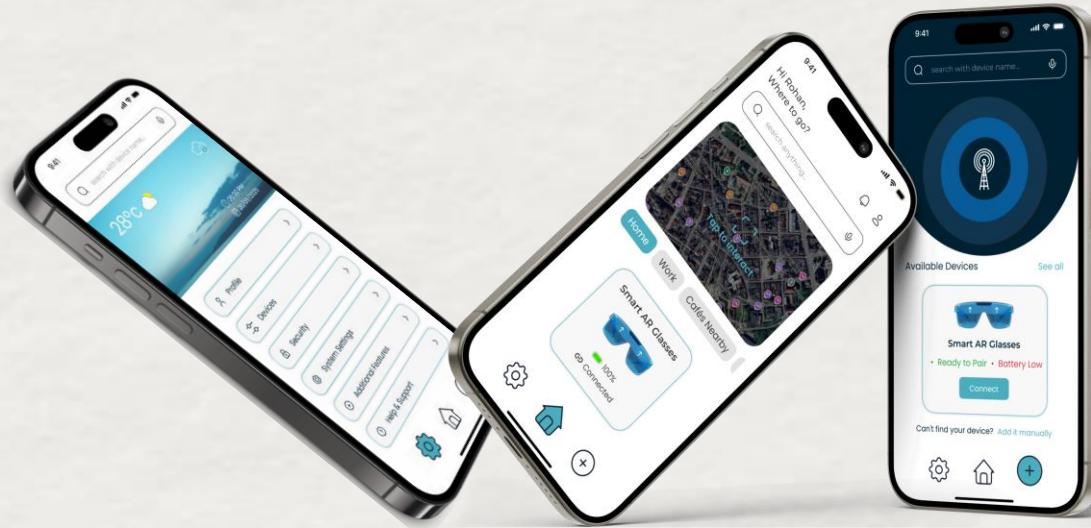
Design

Product Concept Visualization

Wireframes

Mockup Link

https://www.figma.com/proto/OfvJHSuyJqLFDqMQgK2
Zjf/Interaction-Design-Advance?node-id=53-
69&t=ChPwTdpxgqARscjc-0&scaling=scale-
down&content-scaling=fixed&page-id=0%3A1&starting-
point-node-id=53%3A69

Customer Journey Maps (to be)

Scenario:

Rohan walks to a new café using Google Maps, facing minor navigation issues amid traffic and busy streets.

	PLANNING	STARTING NAVIGATION	EN ROUTE	MID-WAY ADJUSTMENT	REACHING DESTINATION	POST-TRIP
ACTION	Opens mobile app and enters café destination.	Puts on smart glasses and starts AR navigation.	Walks while following AR arrows in real space.	Misses a turn but path auto-adjusts.	Sees café name tagged in AR.	Glasses auto-sync data to app.
TOUCHPOINTS	• Mobile App UI	• Glasses • Mobile sync	• AR overlay on road. • Voice guide.	• Voice alert. • Arrow redirect.	• Glasses overlay.	• App dashboard
POSITIVE POINTS	No need to manually search or switch apps.	No screen glare or holding phone.	No confusion in turns, hands-free.	No stress from rerouting.	No looking around or asking for help.	No data lost, battery saved.
OPPORTUNITIES	Suggest cafés based on user history.	Welcome screen or gentle voice guide.	Add speed-based feedback or tips.	Vibration feedback adds support.	Highlight offers at the café.	Show travel time, review, suggestions.
FEELINGS	😃	😉	😰	😌	😍	🤔

Conclusion

This project envisions a **seamless**, **hands-free navigation** experience through **Smart AR Glasses** integrated with a supportive **mobile app**. By combining **user-centered design** and **futuristic technology**, It aimed to solve real-world **navigation challenges**. The concept promotes **safety**, **convenience**, and **accessibility**, reflecting how **wearable tech** can shape our **near future**.

Helpful Links

- https://support.google.com/maps/answer/9332056?co=GENIE.Platform%3DAndroid&hl=en
- https://www.theverge.com/news/654387/meta-smart-glasses-ray-ban-live-translation-ai
- https://www.apple.com/apple-vision-pro/
- https://www.thebusinessresearchcompany.com/report/ar-and-vr-smart-glasses-global-market-report
- https://euphoriaxr.com/ar-vr-industry-trends/
- https://in.mashable.com/tech/62173/ray-ban-meta-smart-glasses-reviews-are-in-3-things-people-hate-about-them
- https://www.pcmag.com/reviews/ray-ban-meta-smart-glasses

Thank You

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