Feasibility Report: Echo Vision

Echo Vision – Smart Assistive Technology for the Visually & Speech-Impaired

Executive Summary

Echo Vision is an AI-powered assistive device designed to empower visually and speech-impaired individuals. It combines **AI navigation, object detection, facial recognition, emotional recognition, health monitoring, and hand gesture-to-speech translation** into a single device.

- Multi-functional: All critical features in one device.
- Inclusive: Supports visually and speech-impaired users.
- **Affordable: Target price ₹25,000 – ₹30,000.**
- Prototype designed: Design phase completed, validating form, usability, and concept.

Competitive Analysis

Echo Vision stands out with all-in-one functionality at a fraction of competitors' cost:

- ✓ **Echo Vision**: ~₹29,000 – navigation, object/facial recognition, emotional recognition, health monitoring, gesture-to-speech translation.
  - **OrCam MyEye 3 Pro**: ~$4,250 (~₹3,50,000) – smart reading, face recognition, color & product identification.
  - **Envision Glasses:** $1,899 – $3,499 (~₹1,60,000 – ₹3,00,000) – text reading, object recognition, face recognition.
  - **WeWALK Smart Cane 2:** $850 – $1,150 (~₹70,000 – ₹95,000) – obstacle detection, GPS navigation, voice assistant.

Competitive Advantage:

· Combines multiple functionalities in a single affordable device.

· Significantly lower cost than competitors.

· Designed for both visually and speech-impaired users.

Financial Feasibility (INR)

- Raspberry Pi 5: ₹12,000
  NVIDIA Jetson Nano Developer Kit (alternative): ₹10,000 – ₹12,000

- Intel RealSense Depth Camera D435i: ₹12,000
- HC-SR04 Ultrasonic Sensors (3 units): ₹900
- MAX30102 Heart Rate and SpO_2 Sensor: ₹500
- NEO-6M GPS Module: ₹1,200
- ESP32 Wi-Fi + Bluetooth Module (2 units): ₹500
- Lithium-ion Battery Pack (10,000 mAh): ₹1,500
- TP4056 Charging & Protection Board: ₹300
- Custom/3D-Printed Casing & Wiring: ₹2,000
  Total Estimated BOM: ~₹29,000

Target Retail Price: ₹25,000 – ₹30,000
Conclusion: **Pricing is feasible with optimized sourcing and bulk procurement.**

Operational Feasibility

- Small multidisciplinary team: embedded systems, AI/ML specialists, software developers, industrial designers.
- Components are readily available.
- Prototype design validates ergonomics, layout, and concept feasibility.

Prototype Design Status

- ✓ **Design phase completed**: sensor placement, layout, and user interaction finalized.
- ✓ **Confirms practical feasibility** and readiness for hardware assembly and AI integration.

Conclusion & Recommendations

- ❖ Echo Vision is technically and conceptually **feasible**, **socially impactful**, and **financially sustainable**.
- ❖ **Prototype design demonstrates usability and concept validation.**
- ❖ Next steps: hardware assembly, AI model integration, and pilot testing.
- ❖ Recommendation: Proceed to prototype implementation and testing phase.