Title: EcoFusion Navigator

Sector: Environment

Name of Institute: Government College of Engineering and Research, Avasari, Pune.

Name of Participants:

- Tushar Sunil Pawar – BE Computer – Management
- Amol Sachin Shende – BE Computer – Marketing & Finance
- Prathamesh Appasaheb Gursal – BE Computer – Technical

Total funding required: ₹45,000

Current Status: *Bootstrapped.* The project has been self-funded so far, and we are now actively seeking investment to roll out operations across **Maharashtra**.

Funding Breakdown:

1. **Cloud Hosting & Infrastructure:** ₹8,000
2. **Website Domain name:** ₹2,000
3. **APIs and Software Costs:** ₹7,000
4. **Marketing & Partnerships:** ₹15,000
5. **Testing & Feedback:** ₹5,500
6. **Miscellaneous & Logistics:** ₹7,500

Do you need mentorship ?

Yes, We are seeking valuable guidance and mentorship in the areas of **market strategy, scaling, partnership development, and effective rollout execution**. Expert insights into **revenue generation models** and **logistics optimization** will be highly valuable to ensure sustainable growth and smooth expansion across Maharashtra.

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Problem Statement & Social Need :

Problem:
- Every year, over 50 million tons of electronic waste are generated globally, but only 20% is properly recycled.
- Improper disposal leads to toxic materials like mercury and lead polluting landfills, harming people and the environment.
- Valuable metals like gold, copper, and palladium are lost because recycling is complicated, inconvenient, or unknown to most users.

Social Need:
- 90% of e-waste ends up in landfills, creating serious environmental hazards.
- 80% of consumers don't know how to dispose of e-waste safely.

Impact:
- Health hazards reduction, environmental cleanup, and recovery of valuable resources.
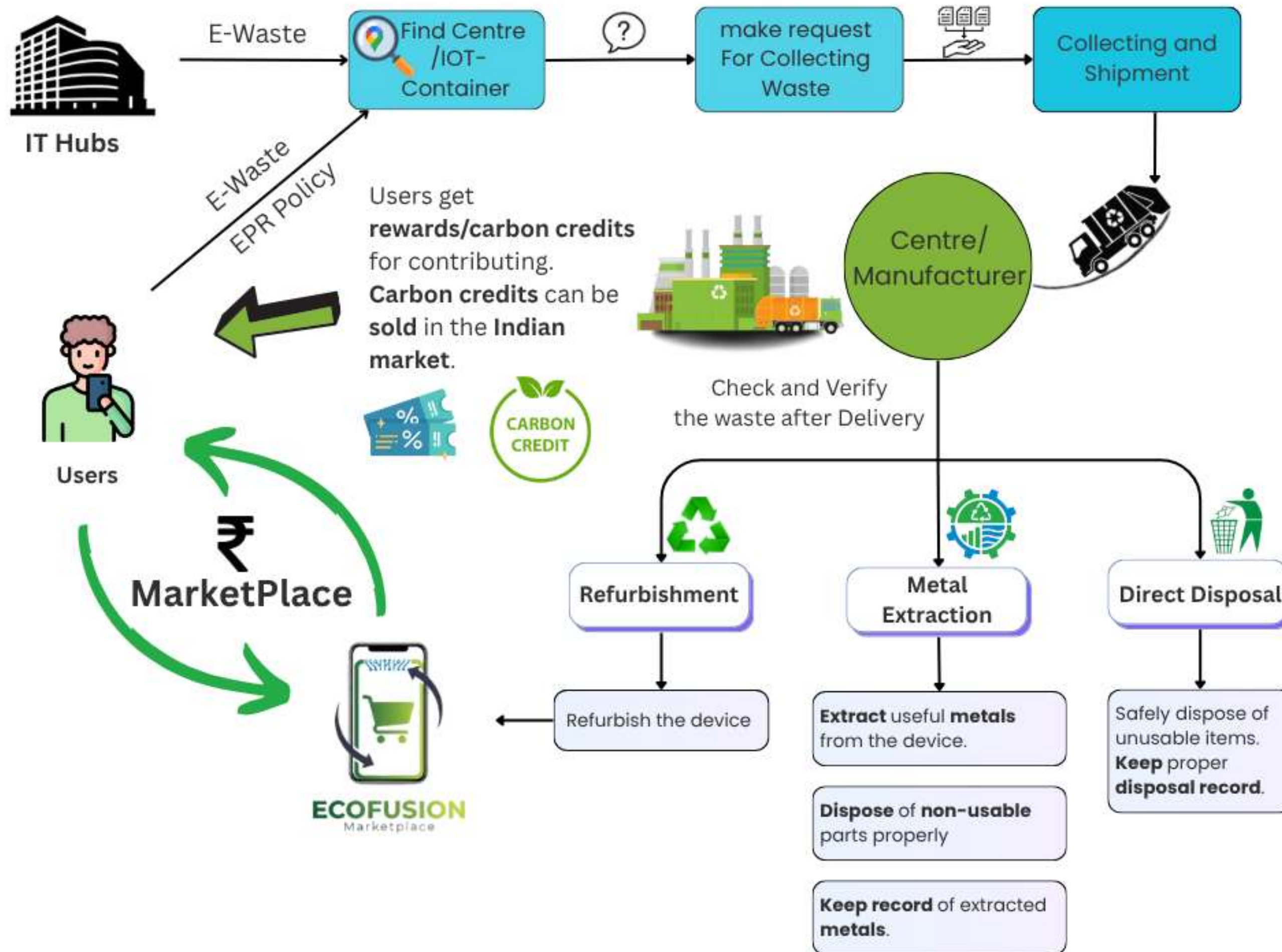
Solution & Social Impact :

EcoFusion Navigator: A one-stop web app that makes e-waste recycling **easy, secure, and rewarding.**

➢ **Real-time Map:** Easily locate government-certified recycling centers and schedule pickups from your location.

➢ **Marketplace:** Buy and sell refurbished electronics in a secure, eco-friendly marketplace.

➢ **Gamification:** Earn points, badges, eco-certificates, and carbon credits for your recycling activities. These credits can be traded in the Indian market.

➢ **Carbon Credit** Tracking: Track verified recycling actions, convert them into carbon footprints, and generate tradable carbon credits.

➢ **EPR Compliance:** Automatically generate reports for producers and recyclers to meet Extended Producer Responsibility requirements.

➢ **Secure Data Wipe:** Safely erase personal data from old devices before recycling, with certified disposal.

➢ **Educational Hub :** Access tips and guides to develop sustainable recycling habits.

➢ **Transparency & Trust:** Track your devices, warranties, and recycler ratings for full accountability.

➢ **Inclusive Platform:** Designed for citizens, IT hubs, recyclers, manufacturers, and government agencies to participate seamlessly.

Environmental & Social Impact:

➢ Reduces landfill waste & prevents toxic pollution.

➢ Recovers valuable metals and resources.

➢ Builds a **circular economy** with refurbished devices.

➢ Empowers citizens with rewards while supporting SDGs (3, 6, 11, 12, 13).

➢ Helps companies & individuals **offset carbon footprint.**

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TECHNICAL APPROACH

Innovation & Differentiation :

What makes EcoFusion Navigator Innovative?

❖ **All-in-one platform** : Combines **map, pickup, secure data wipe, marketplace, gamification & carbon credits** in a single app.

❖ **Traceable & Transparent** : Every device tracked from user to recycler with **EPR compliance reports**.

❖ **Carbon Credits Integration** : Transforms recycling into **economic value** by generating tradable credits.

❖ **Gamified Recycling** : Turns a boring task into a **fun, rewarding habit** with points, badges & eco-certificates.

❖ **Inclusive by Design** : Works for **citizens, IT hubs, recyclers, manufacturers & government** alike.

Differentiation from competitors:

❖ Unlike other apps, integrates, **real-time location tracking**, and **gamified incentives , EPR** Compliance **, secure data wiping** in one platform.

❖ Encourages adoption by making sustainability **fun, rewarding, and impactful**.

Target Beneficiaries & Market :

Who Benefits:

- **Citizens & Tech Users** – Simple, safe way to recycle old devices and buy trusted refurbished products
- **IT Hubs & Corporates** – Bulk device disposal with certified data wiping and EPR compliance.
- **Recyclers & Manufacturers** – Verified collection network, higher material recovery, new business opportunities.
- **Government & NGOs** – Supports **SDGs, Net-Zero 2070, Swachh Bharat, and EPR laws** with transparent reporting.

Market Opportunity:

- **Global Scale:** 50M+ tons of e-waste generated every year, billions of device users.
- **High Demand:** Only 20% recycled today massive untapped market.
- **Scalable Platform:** Built on cloud to support millions of users seamlessly.

In **India First, Global Next:** Aligned with India's digital & sustainability missions, with potential to expand worldwide.

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Business Model & Sustainability :

Revenue Streams:

- **Marketplace Fees** : Commission on buying/selling refurbished electronics.
- **Subscription Plans** ; Premium features for businesses and IT hubs.
- **Partnership Fees** : Collaborations with certified recyclers & manufacturers.
- **Eco-Brand Advertising** : Promote green products to engaged users.
- **Carbon Credit Trading** : Monetize verified recycling actions.
- **Government Grants & Funding** : Support for environmental initiatives.

Sustainability & Impact:

- **Multi-revenue model** : ensures long-term financial stability and scalability.
- **Circular economy driver** : reduces e-waste, recovers valuable resources, and extends device life.
- **Supports SDGs** 3 (Good Health), 6 (Clean Water), 11 (Sustainable Cities), 12 (Responsible Consumption), 13 (Climate Action).
- **Social + Economic Win :** incentivizes responsible recycling while generating green jobs and carbon credit value.

Progress & Roadmap :

Current Stage:
- Prototype **50% complete** (TRL 4).
- Frontend: React.js, Mapbox, Tailwind CSS.
- Backend: Node.js, Express.js, MongoDB.
- Hosted on Render/Vercel with basic JWT authentication.

Next Steps:
- **Month 1-2:** Complete backend integration, add location services, secure data destruction, and finalize prototype.
- **Month 3-4:** Build full system features, including marketplace expansion, gamification, and carbon credit tracking.
- **Month 5-6:** Add user accounts, rankings, feedback system, and prepare for full launch.

Challenges & Strategies:
- **User Adoption:** Gamification, eco-rewards, carbon credits to motivate users.
- **Recycler Network:** Partner with certified recyclers and government agencies.
- **Data Security:** Certified wiping and encryption for trust.
- **Marketplace Trust:** Ratings, warranties, and compliance ensure confidence.

✓ **Prototype Link**   **Login detail:**
✓ **Demo Video Link**   **Id: i2i@gmail.com**
password: 123

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References :

1. Central Pollution Control Board (CPCB), E-Waste Management Rules, 2022, Ministry of Environment, Forest & Climate Change, Govt. of India.

2. E-Waste Management System, EPR Portal, Govt. of India.

3. Maharashtra Pollution Control Board (MPCB), Electronic Waste Management.

4. IIT Delhi Research on E-Waste Recycling Technology.

5. Kahhat, R., Kim, J., et al. (2008). E-waste management systems, ScienceDirect.

6. Bhat, V., Patil, Y. (2015). E-waste management: Public health challenge, IEEE ICGCIoT, IEEE.

National Missions Supported:
- Extended Producer Responsibility (EPR) Compliance [1],[2].
- Atmanirbhar Bharat [4].
- Net-Zero by 2070 Mission [4].
- Swachh Bharat Mission [1],[3].
- Sustainable Development Goals (SDGs 11, 12, 13) [5],[6]

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