SMART INDIA HACKATHON 2025 SIM SMART INDIA HACKATHON 2025

TITLE PAGE

- Problem Statement ID SIH25070
- Problem Statement Title- Secure Data

Wiping for Trustworthy IT

- Theme- Miscellaneous
- PS Category-Software
- Team ID- 88887
- Team Name (Registered on portal)-

Data Morphs





IDEA TITLE



Solution

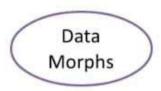
- Develop a secure, cross-platform data wiping application (Windows, Linux, Android, Offline ISO/USB).
- One-click interface for easy use by the general public.
- Tamper-proof wipe certificate (PDF + JSON, digitally signed).
- Supports hidden storage erasure (HPA, DCO, SSD sectors).
- Third-party verifiable and aligned with NIST SP 800-88 standards.

Problem Resolution

- Eliminates fear of data breaches → users can recycle devices without risk.
- Reduces hoarding of unused IT assets (₹50,000+ crore locked value).
- Simplifies data sanitization → no need for complex or expensive tools.
- Ensures trust, transparency, and compliance in ewaste recycling workflows.

Unique Value Proposition (UVP)

- First open, verifiable, and user-friendly data wiping tool in India.
- Proof of erasure builds confidence among individuals, enterprises, and recyclers.
- Cross-platform + offline support → usable anytime, anywhere.
- Drives safe e-waste management and strengthens India's circular economy.



TECHNICAL APPROACH



Technical Approach

- Algorithm Development: Implements NIST SP 800-88 and DoD wipe standards, covering HDDs, SSDs, and hidden areas (HPA/DCO), ensuring complete and compliant erasure.
- Mobile App Development: Cross-platform app for Windows, Linux, Android, with a simple one-click interface and offline ISO/USB support for devices without OS.
- Encryption & Security: Generates digitally signed, tamper-proof certificates using RSA/ECC, with encrypted logs and integrity checks for trust and compliance.
- Cloud Services: Provides a verification portal for wipe certificates, with secure storage, audit trails, and enterprise integration for large-scale use.

Product Status

- Implemented: Core wipe algorithms, prototype desktop app, basic certificate generation.
- In Progress: Mobile app UI, ISO/USB boot support, cloud verification backend.
- Planned: Enterprise integration and large-scale pilot testing.

Prototype

Hidden Area Cleanup

Certificate Generation

Local Save / Closet Upload

Third-Party
Verification

Charlestift & History



FEASIBILITY AND VIABILITY



Analysis of Idea

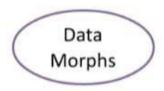
- Technically possible using secure wipe standards (NIST, DoD).
- Works across platforms: Windows, Linux, Android, Offline ISO/USB.
- Meets real need: users fear data breaches, so assets are hoarded.
- Economically viable: unlocks value of unused IT assets.
- Environment friendly: promotes safe e-waste recycling.
- Scalable: can serve individuals, recyclers, enterprises.
- Trustworthy: verifiable certificates build confidence.
- Aligns with national goals: supports India's circular economy initiatives.

Challenges & Risks

- Different hardware types (HDD, SSD, Android)
- Low user awareness and adoption
- · Building trust and compliance proof
- · Managing cloud and scalability

Strategies

- Modular algorithms for all devices
- Simple one-click interface + awareness efforts
- · Tamper-proof certificates with signatures
- · Scalable cloud backend with APIs



IMPACT AND BENEFITS



Potential on Target Audience

- General Users: Can safely recycle old laptops, smartphones, and other devices without worrying about personal or sensitive data being recovered.
- Enterprises & Organizations: Enables secure disposal of IT assets, reducing storage costs and legal compliance risks.
- Recyclers & IT Asset Disposal Firms: Provides verifiable, tamperproof proof of data erasure, building trust with clients.
- Government & NGOs: Supports e-waste management initiatives and policies, encouraging sustainable and circular economy practices.

Benefits of the Solution

- Builds User Confidence: One-click, secure wiping ensures data is permanently erased.
- Reduces Asset Hoarding: Unlocks the value of unused IT devices, preventing millions of rupees of IT assets from being locked away.
- Promotes Safe E-Waste Management: Prevents environmental hazards caused by improper disposal of electronic devices.
- Supports Circular Economy: Recycled devices can be reused, refurbished, or safely dismantled, contributing to a sustainable lifecycle.
- Transparent & Auditable: Digitally signed certificates allow thirdparty verification, enhancing trust and compliance.

Data Morphs

RESEARCH AND REFERENCES



- Forti, V., Baldé, C.P., Kuehr, R., Bel, G. (2020). The Global E-Waste Monitor 2020: Quantities, flows, and circular economy potential. United Nations University.
 - Supports understanding of the e-waste problem and the need for device recycling.
- National Institute of Standards and Technology (NIST, 2014). Guidelines for Media Sanitization (SP 800-88 Rev.1).
 Provides standards for secure and verifiable data wiping, forming the basis of the solution's algorithms.
- Department of Defense (DoD 5220.22-M, 1995). National Industrial Security Program Operating Manual.
 Guidelines for overwriting data to ensure irrecoverable erasure, used in the solution design.
- Bhattacharya, J., Sharma, S. (2019). E-Waste Generation and Management in India: Challenges and Opportunities. Journal of Environmental Management, 232, 121–131.
 - Highlights India-specific e-waste challenges that the solution addresses.
- Manhart, A., et al. (2017). Circular Economy in Electronics: Enabling Secure Data Erasure and Asset Reuse. Resources, Conservation & Recycling, 124, 156–165.
 - Supports the solution's goal of safe reuse and refurbishment of IT devices.
- Singh, A., Gupta, R. (2021). Secure Mobile Data Wiping Techniques for Consumer Devices. International Journal of Information Security, 20(3), 345–359.
 - Informs the mobile app design and cross-platform functionality of the solution.
- Cui, J., et al. (2018). Data Sanitization and Verification Methods for Recycled IT Assets. Journal of Cleaner Production, 196, 1234–1245.
 Supports implementation of tamper-proof wipe certificates and verification systems.