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| ***Challenge Title / Objective*** | E-Waste Tracking and management |
| ***Nature of Challenge*** | Product Related |
| ***Domain / Discipline of Challenge*** | Sustainability |
| ***Challenge Description (With Technical Specifications)***   |  |  | | --- | --- | | ***Background*** | 'E-waste, or electronic waste, is a growing global challenge due to the rapid pace of technological advancements.  Globally on an average only 20 % of the ewaste is officially reported as properly collected and recycled. Improper disposal of e-waste poses significant environmental and health risks. Effective e-waste management requires accurate tracking, efficient collection, and responsible recycling. | | ***CHALLENGE / REQUIREMENT*** | Develop a comprehensive e-waste tracking and management system that enables real-time monitoring of e-waste from its generation to its final disposal. The system should facilitate efficient collection, proper segregation, and responsible recycling of e-waste while ensuring data privacy and security. The solution shoudl also be able to get the details from recycling vendors on materials purifiedz, trace the usage of recycled material. | | ***Deliverables*** | 1) Software based solution / platform  2) Details of recycling (Material, Purity rate of material, quanity, resourses used etc )  3) Should be able to trace the reverse supply chain to close the loop. | | |
| ***Known Bottlenecks / critical areas / Key factors to be addressed*** |  |
| ***Existing Solution (If Any)*** |  |
| ***Images Attachment*** |  |

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| ***Concept Title*** | E-Waste Tracking and management |
| ***Keywords*** | E-Waste,Electronic Waste,Sustainability,Real-Time Monitoring,Recycling Management,Environmental Impact,Data Analytics,GPS Tracking,User Engagement,Mobile Application |
| ***Concept*** | The E-Waste Tracking and Management System aims to tackle the escalating issue of electronic waste (e-waste) through a comprehensive approach that combines technology, user engagement, and data analytics. Central to the system is real-time monitoring, enabling users to track e-waste from generation to final disposal via GPS and IoT technologies, which enhances transparency and trust in the management process. To promote user engagement, the platform offers an intuitive mobile and web interface for easy scheduling of pickups and reporting of e-waste, while community forums encourage knowledge sharing and collaboration. The system prioritizes efficient collection and segregation of e-waste, leveraging online scheduling and AI algorithms for automated classification based on material type and hazard levels. Collaboration with certified recycling vendors is crucial, as the platform integrates real-time updates on recycling processes, including metrics on material purity and quantities processed. By harnessing data-driven insights, the system analyses e-waste generation and recycling rates, employing machine learning algorithms to predict trends and highlight improvement areas. Additionally, the platform features reverse supply chain tracking, visualizing the lifecycle of recycled materials from vendors back to manufacturers or consumers, thereby promoting a circular economy. Technically, the system employs a user-friendly frontend built with React.js or Angular and a robust backend developed with Node.js (Express) or Django. It utilizes PostgreSQL or MongoDB for data management and implements real-time functionalities via WebSocket or Firebase, ensuring timely user notifications. Leveraging cloud infrastructure like AWS or Google Cloud ensures scalability and reliability. |
| ***Image of Concept*** |  |

