The Challenge-

Air pollution is increasing rapidly. It is crucial to take necessary steps regarding it. Increased air pollution has led to an increase in asthma cases and other airborne diseases. One of the reasons for air pollution is the emissions that come out of the vehicles. Many vehicles' owners neglect maintenance, leading to excessive emissions.

Impact on the Public-

1) Environmental damage- Increase of pollutants in the atmosphere causes global warming, depletion of ozone layer etc.

2) Health Issues- Increased air pollution results in chances of air borne diseases like asthma, measles, pneumonia, COVID etc.

Our Vision-

Our goal is to reduce the pollution that cars cause by emitting dangerous pollutants like PM2, NOx, and CO2.5. An in-car real-time pollution monitoring system that assists citizens, legislators, and law enforcement in efficiently lowering emissions.

Solution-

A pollution sensor will be installed in cars to monitor their pollution levels and send out notifications via a mobile app when repairs are necessary. If these alerts are disregarded, a fee will be applied. Additionally, the app will monitor the vehicle's PUC certificate and alert the user when the certificate needs to be renewed.

Technologies Needed:

1. Hardware Components:
    - Gas Sensors to detect NO_2, CO, CO_2, and VOCs.
    - PM Sensors to measure PM2.5 and PM10 levels.
    - OBD-II Module to collect vehicle emission data.
    - Microcontrollers (ESP32, Raspberry Pi) to process sensor data.
2. Software & Connectivity:
    - IoT & Data Transmission (Bluetooth, WiFi, 4G/5G) for real-time data transfer.
    - AI & Analytics for predicting pollution trends.
    - Mobile & Web Apps (React Native, Python, MySQL) for alerts and storage.
3. Cloud & Government Integration:
    - Cloud Processing (AWS, Google Cloud) for real-time analytics.
    - Government API to connect data to pollution control boards.

Key Features:

- IoT-based Sensors for real-time detection of CO_2, NOx, and PM2.5 levels.
- Mobile App Integration to alert drivers and suggest actions.
- Government Dashboard to track emission hotspots and enforce regulations.

Implementation Approach

A structured plan like below can be followed in making this project a reality

Phase 1- Research and development

- Examine the current levels of vehicular pollution and pinpoint the main issues.
- Create and improve a functional pollution sensor prototype.

Phase 2- Pilot Testing

- Start small-scale trial projects in regions with high pollution levels.
- To improve sensor accuracy and app functioning, gather real-world data and analyse user comments and make any required modifications.

Phase 3- Full Scale Deployment

- Launch awareness-raising initiatives to promote adoption.
- Work together with government organizations to ensure smooth enforcement.

Key Partnership

- **Government Bodies:** Collaborate with the transportation and pollution control divisions to implement rules.
- **Automobile Manufacturers:** Include pollution sensors in both new and used models.
- **Technology Firms:** Improve data collecting and analysis by utilizing AI and IoT specialists.
- **Environmental Organizations:** Collaborate with NGOs to promote community involvement and raise awareness.

Resource Requirements

- **Technology**: IoT sensors, cloud computing, and mobile applications.
- **Human Resources**: Engineers, regulatory experts, and public health specialists.
- **Funding**: Investment for research, development, and large-scale production.

Measuring Impact & Success

- **Decrease in Vehicle Emissions:** Monitor air quality before and after implementation.
- **Health Benefits:** Track improvement in respiratory health statistics in affected regions.
- **Regulatory Compliance:** Measure the increase in pollution control certificate renewals.

Call to Action:

Collaboration and Support: Government agencies, corporations, and environmental groups are all invited to form collaborations with us. Stakeholders and investors can assist in expanding this solution to more cities.

Next Steps:

- Secure funding for mass production.
- Expand partnerships with automobile manufacturers.
- Deploy the solution in multiple regions and track results.

Contact Us

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