

**Instructions for Participants**

* Please make a **copy** of this document and rename it as:  
  *“TeamName\_InstituteName\_IdeaName”*
* Fill out all sections clearly and concisely.
* Use narrative, bullet points, visuals, or diagrams if needed.
* Submit the **Google Docs shareable link** with “Viewer” access.

**Team Details:**

***Briefly introduce your team.***

*Add all team members. You can also include a short 2–3 line team summary. Share their portfolio link (GitHub, Behance, Hacker Rank, etc…) for our better understanding (at least share 2 members’).*

* *Note: This will help us to assess your team strength from technical to business*

Team name:

Team member’s Name, University, Department, Latest Certificate:

1. Md. Yousuf Hossain
2. Abdul Al Mahin
3. S M Nabil Ausaf,Dhaka International University, CSE,
4. Ummey Hafsa

Team Summary:

Our team combines deep technical expertise in AI and machine learning with a thorough understanding of the telecom industry. We are committed to making digital payments simpler and more efficient for millions of users across India, starting with Vodafone Idea subscribers. Together, we bring a mix of skills, industry knowledge, and passion for innovative solutions.

### Core Idea

**What problem are you solving?** *Current cigarette filters are passive, unmeasurable, and offer no real-time feedback on how much nicotine, tar, carbon monoxide (CO), or fine particulates a user is actually inhaling. Smokers—and even bystanders—remain unaware of their true exposure levels, making it hard to reduce risk or make informed choices.*

**Why does it matter?***Tobacco use causes over 8 million deaths globally each year. Even “filtered” cigarettes deliver dangerous toxins. Without data, users can’t assess harm reduction efforts, and public health programs lack tools to personalize interventions.*

**What is your proposed solution?** *We propose “SmokeIntel”—an AI-powered tobacco filtration intelligence system that combines:*

* *A portable IoT smoke analyzer (using CO, PM2.5, and VOC sensors) to measure real-time toxin output,*
* *An ML model that predicts filter efficiency and estimates short-term health impact,*
* *A mobile app that visualizes exposure trends, tracks usage, and nudges users toward safer behaviors or cessation,*
* *Digital simulations (in Python/MATLAB) to virtually test next-gen filter designs.*

**What makes it unique or innovative?** *Unlike mechanical filters or generic quit-smoking apps, our solution closes the loop between hardware sensing, AI analytics, and user behavior. It’s the first CSE-driven platform that treats tobacco filtration as an active, measurable, and adaptive health interface—not just a piece of cellulose.*

*Example: “We aim to build an AI-driven smoke analyzer that measures real-time toxin levels from cigarette smoke and delivers personalized health feedback via a mobile app—turning passive filters into intelligent harm-reduction tools.”*

### Feasibility & Growth Potential

***What makes your idea practical and achievable?***

* *Uses low-cost, off-the-shelf hardware: ESP32 microcontroller + MQ135/PMS5003 sensors (~$20 total).*
* *Leverages public datasets from WHO, CDC, and tobacco research labs for training ML models.*
* *Built on proven tech stacks: TensorFlow Lite (on-device AI), Firebase (real-time data), Flutter (cross-platform app).*
* *Requires no changes to cigarette design—users simply exhale near the device.*

*Are there any existing similar solutions? How is yours better?*

* *Existing: Quit-smoking apps (e.g., QuitNow!) track habits but don’t measure actual smoke toxins. Lab-grade analyzers exist but are expensive and non-portable.*
* *Ours: First affordable, portable, and AI-enhanced system that quantifies real exposure and links it to behavioral feedback—bridging the gap between engineering and public health.*

***How can this idea grow or expand in the future?***

* *Phase 1: Deploy in public health clinics and university research labs for pilot studies.*
* *Phase 2: Partner with municipal bodies to install smart ashtrays in urban zones that monitor ambient smoke pollution.*
* *Phase 3: License simulation models to filter manufacturers or regulatory agencies (e.g., FDA) for digital certification of filter efficacy.*
* *Long-term: Expand to vaping/e-cigarette safety monitoring or indoor air quality systems in hospitality venues.*

### Technology Stack & AI Tools

*Programming languages, frameworks, and APIs*

* *Python: For ML modeling, data analysis, and smoke flow simulation*
* *C++: For embedded firmware on ESP32/Arduino*
* *Flutter/Dart: For iOS/Android mobile app with real-time dashboard*
* *Flask: Lightweight backend API to connect sensor data to cloud*
* *Firebase Auth & Firestore: For user accounts and exposure history*

*AI/ML models, datasets, or cloud tools*

* *Scikit-learn / XGBoost: Regression models to predict toxin levels from sensor readings*
* *TensorFlow Lite: On-device inference for real-time health risk scoring*
* *OpenCV: Image analysis of filter discoloration to estimate usage wear*
* *Datasets: WHO Global Tobacco Report, CDC NHANES smoke exposure data, IEEE sensor fusion benchmarks*
* *Cloud: AWS IoT Core (for device management), Google Cloud Storage (for anonymized research data)*

*Hardware or integration needs*

* *Sensors: MQ135 (CO/NH₃), PMS5003 (PM2.5), CCS811 (VOCs)*
* *Microcontroller: ESP32-WROOM (Wi-Fi + Bluetooth)*
* *Power: Rechargeable Li-ion battery (portable form factor)*
* *Integration: BLE/ Wi-Fi to sync with mobile app; optional USB for lab-mode data export*

*Example: “Python, TensorFlow Lite, ESP32, MQ135/PMS5003 sensors, Firebase, AWS IoT, and OpenCV for image-based filter analysis.”*

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### Projected Impact

**Who are your target users or beneficiaries?**

* *250+ million adult smokers in India seeking to understand or reduce health risks*
* *Public health researchers needing real-world smoke exposure data*
* *Urban environmental agencies monitoring secondhand smoke in public spaces*
* *Medical professionals supporting tobacco cessation programs*

**How many lives might be improved or affected?** *If deployed in just 10 major Indian cities, the system could reach 500,000+ users in 2 years. At scale, it has the potential to influence tens of millions through public health partnerships.*

**What kind of impact will your idea have?**

* *Social: Empowers individuals with transparent health data; supports India’s National Tobacco Control Programme*
* *Health: Reduces long-term disease burden (e.g., COPD, cancer) through early awareness*
* *Environmental: Enables monitoring of secondhand smoke pollution in shared spaces*
* *Industrial: Creates a new category of “smart harm-reduction” devices in med-tech and IoT*

**How will success be measured?**

* *50% reduction in average user-perceived uncertainty about toxin exposure (via app surveys)*
* *30% increase in engagement with cessation resources among active users*
* *15–20% estimated drop in daily smoke intake (based on behavioral adaptation)*
* *10+ research papers or policy briefs using anonymized platform data within 3 years*

