

Problem Statement :

“ Air and water pollution, particularly from industries, pose significant health risks and harm the environment. Currently, there's a lack of real-time, easy-to-access pollution data for the public and government. This makes it difficult to effectively address pollution issues caused by industries. Our project will deploy pollution sensors and use AI to analyze the data. This will provide transparent pollution information and insights for communities and government authorities. By making this data accessible, we aim to raise awareness, empower communities, and drive industries and governments to reduce pollution. “

Goals:

- Deploy air and water pollution sensors to collect real-time data.
- Use cloud-based solutions to store and process this data.
- Implement AI/ML tools to analyze and visualize pollution trends.
- Make data transparent and easily accessible to the public and government through a comprehensive web platform.
- Encourage industries to reduce pollution through a competitive leaderboard.
- Provide actionable insights and regular reports to government agencies to aid in policy making and enforcement.
- Enable public engagement and feedback through features like a complaint register and news updates.
- Empower environmental activists and journalists by making pollution data available for publication in news articles and reports, raising awareness and driving community action.

Social Impact:

- Transparency: Providing real-time pollution data empowers communities with knowledge about their environmental conditions.
- Public Engagement: Features like the complaint register allow citizens to report pollution issues directly, fostering a proactive approach to environmental management.
- Media and Advocacy: Making data publicly available enables environmental activists and journalists to highlight critical issues, advocate for change, and hold industries and governments accountable.
- Awareness and Education: Through news updates and detailed reports, the public becomes more informed about pollution sources and trends, driving collective action towards a cleaner environment.

Currently Working Solutions :

Of the 28 states and eight union territories of India, CEMS links for 18 states and one UT were provided in the Rajya Sabha reply of the ministry of environment. Of these States/UTs, only seven were found to have real-time CEMS(Continuous Emissions Monitoring Systems) data which could be used by the public to understand the type and degree of air pollution emissions from the industries located in their areas. But even for these seven states that have reported industrial pollution data, there is no consistency in the data formats and the results of the CEMS datasets are not available in Open Data (Machine Readable data formats)—the only way in which the data can be used for any meaningful analysis. According to globally accepted norms, all such industrial datasets are to be provided in csv (comma separated value) formats which allow for the datasets to be analysed at scale and in real-time.

More information :

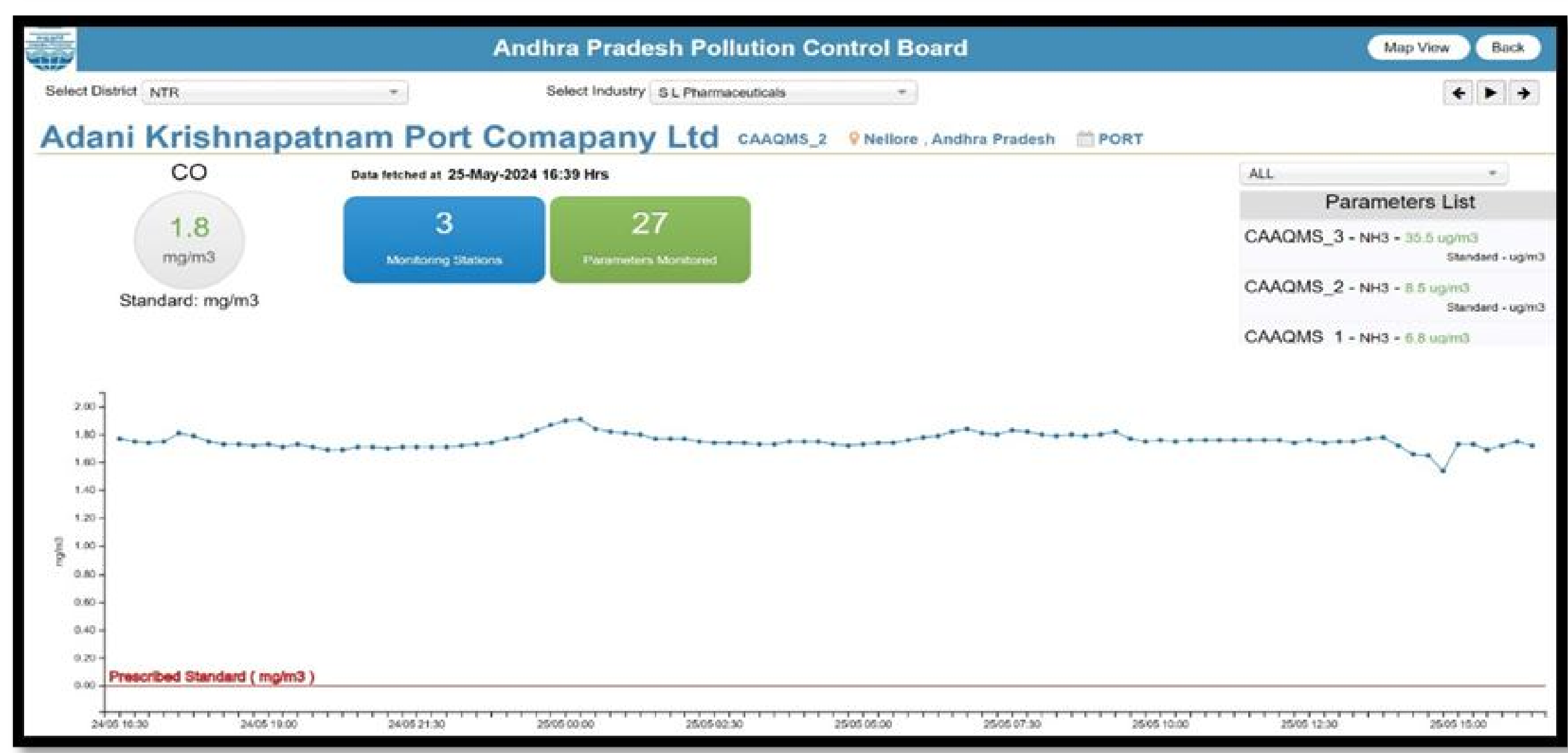
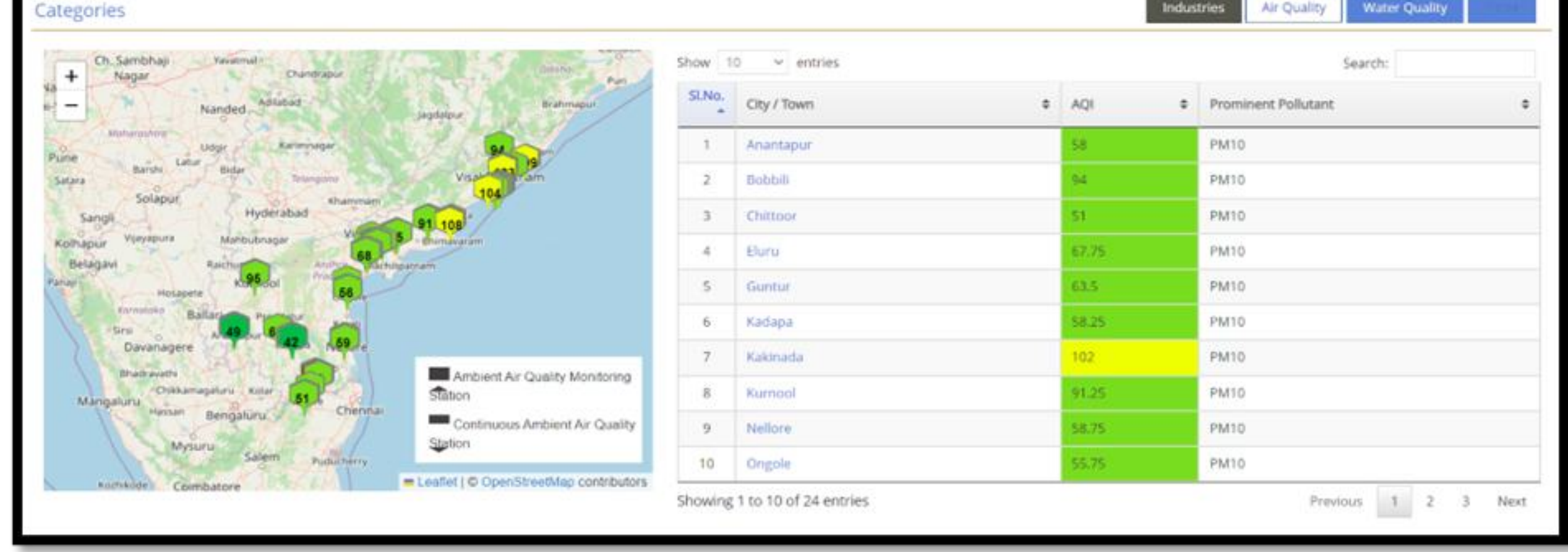
PDF : <https://www.orfonline.org/public/uploads/posts/pdf/20230510233208.pdf>

Example:

The current system of Andhra Pradesh: Divides each industry into 6 classes based on the pollution level.

Link : <http://aprtprms.ap.gov.in/publicview.html>

AQI	Remark	Color Code	Possible Health Impacts
0-50	Good		Minimal impact
51-100	Satisfactory		Minor breathing discomfort to sensitive people
101-200	Moderate		Breathing discomfort to the people with lungs, asthma and heart diseases
201-300	Poor		Breathing discomfort to most people on prolonged exposure
301-400	Very Poor		Respiratory illness on prolonged exposure
401-500	Severe		Affects healthy people and seriously impacts those with existing diseases
NA	Not Available		AQI data not available



What we are providing :

Unique Aspects of the Project:

1. Real-Time Data: Providing real-time pollution data from industries, which is often lacking or delayed in existing systems.
2. Transparent Access: Creating a platform that offers transparent access to pollution data for both the public and government authorities.
3. AI/ML Analysis: Leveraging AI and machine learning for in-depth analysis of pollution trends and patterns.
4. Comprehensive Insights: Providing detailed insights and actionable recommendations based on the analyzed data.
5. Public Engagement: Enabling public engagement through features like complaint registration and access to environmental news.
6. Media Integration: Collaborating with media outlets to publish pollution data and raise awareness.
7. Government Collaboration: Working closely with government agencies to facilitate policy-making based on real-time data.
8. Impact Measurement: Measuring the impact of pollution reduction efforts through data-driven metrics.
9. Scalability: Designing a scalable system that can be replicated in different regions or expanded to cover various types of pollutants.
10. Community Empowerment: Empowering communities to take action against pollution through data-driven insights and public engagement.

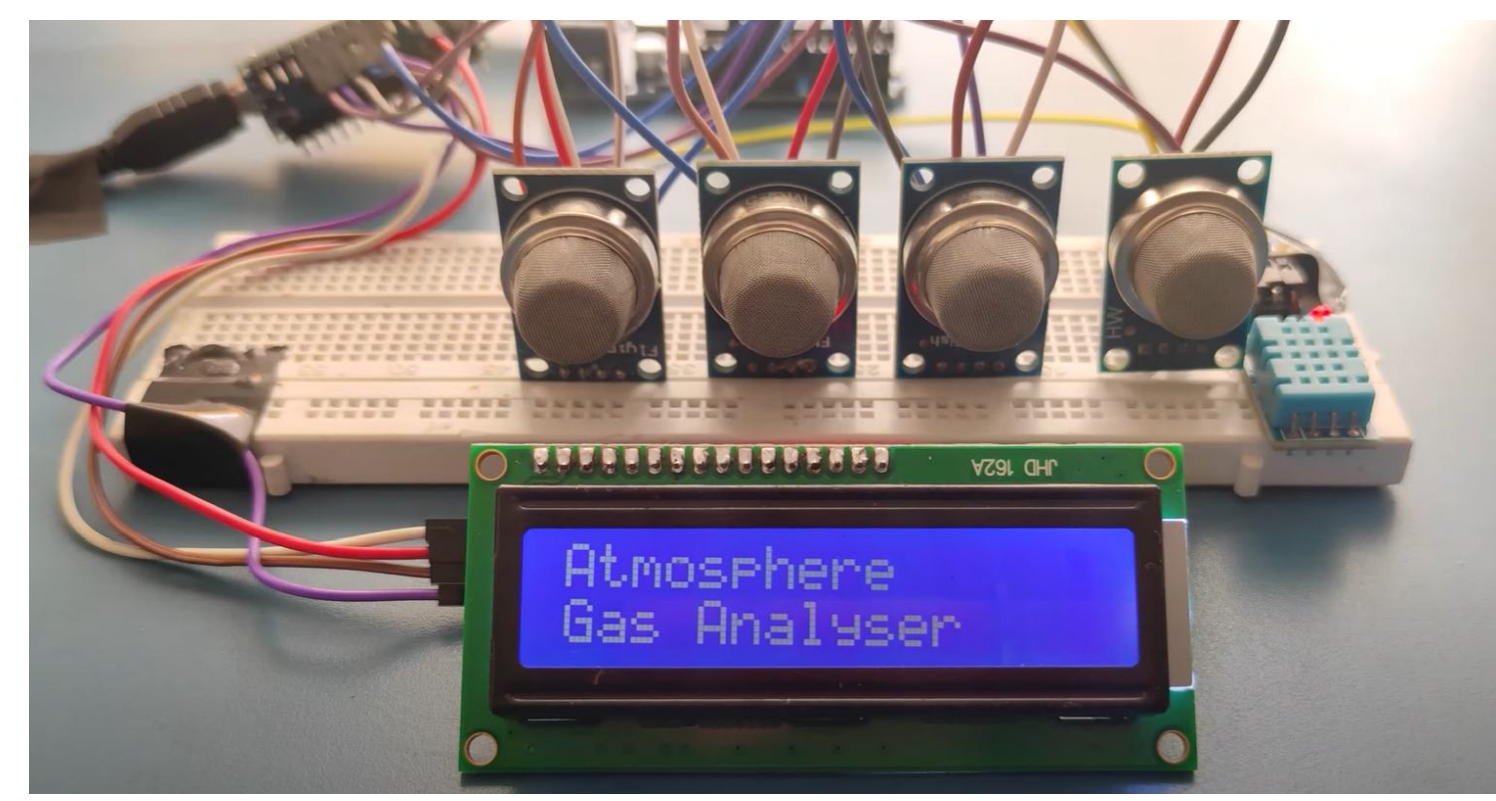
Hardware approach:

We will use different sensors given below in order to take different readings.

(1) Air pollution related sensors:

MQ Sensors : [Product link](#)

Electro Chemical Senesors : [Product link](#)

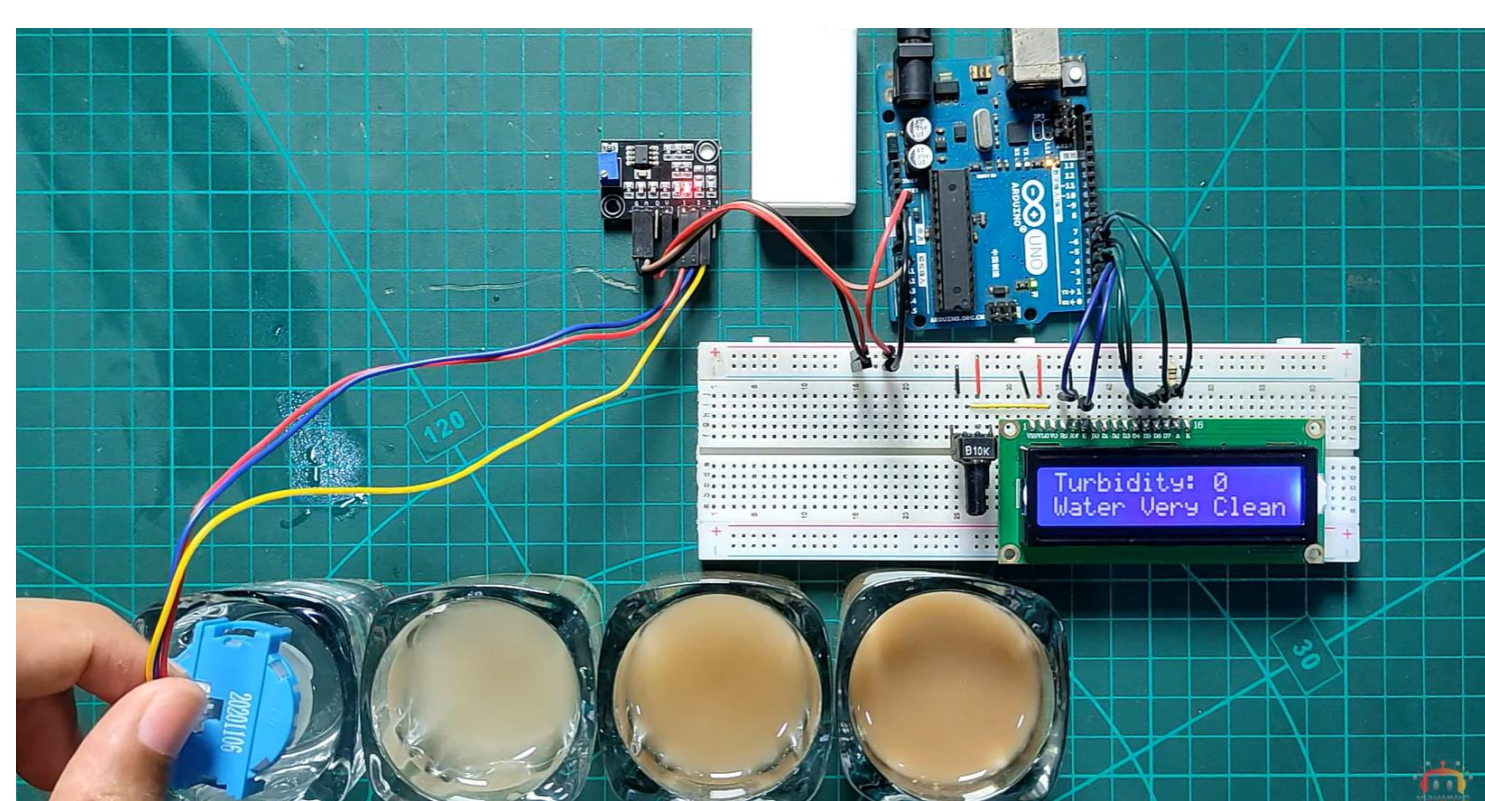


[Youtube](#)

(2) Water pollution related sensors:

Turbidity Sensor Module : [Product link](#)

Other sensors : [Product Link](#)



[Youtube](#)

Software approach:

- login and connect with your device
- Competetion and leaderboard of industries
- Problematic News
- Monthly or yearly analysis report for gov.
- Dashboard of industries
  - >diff. graphs
  - >excel files
  - >Indian map and visualization of pollution rate by that
  - >Main faults and imprevement opportunities
  - >report
- complain register
- Environment industries contact for news
- AI use to give analysis

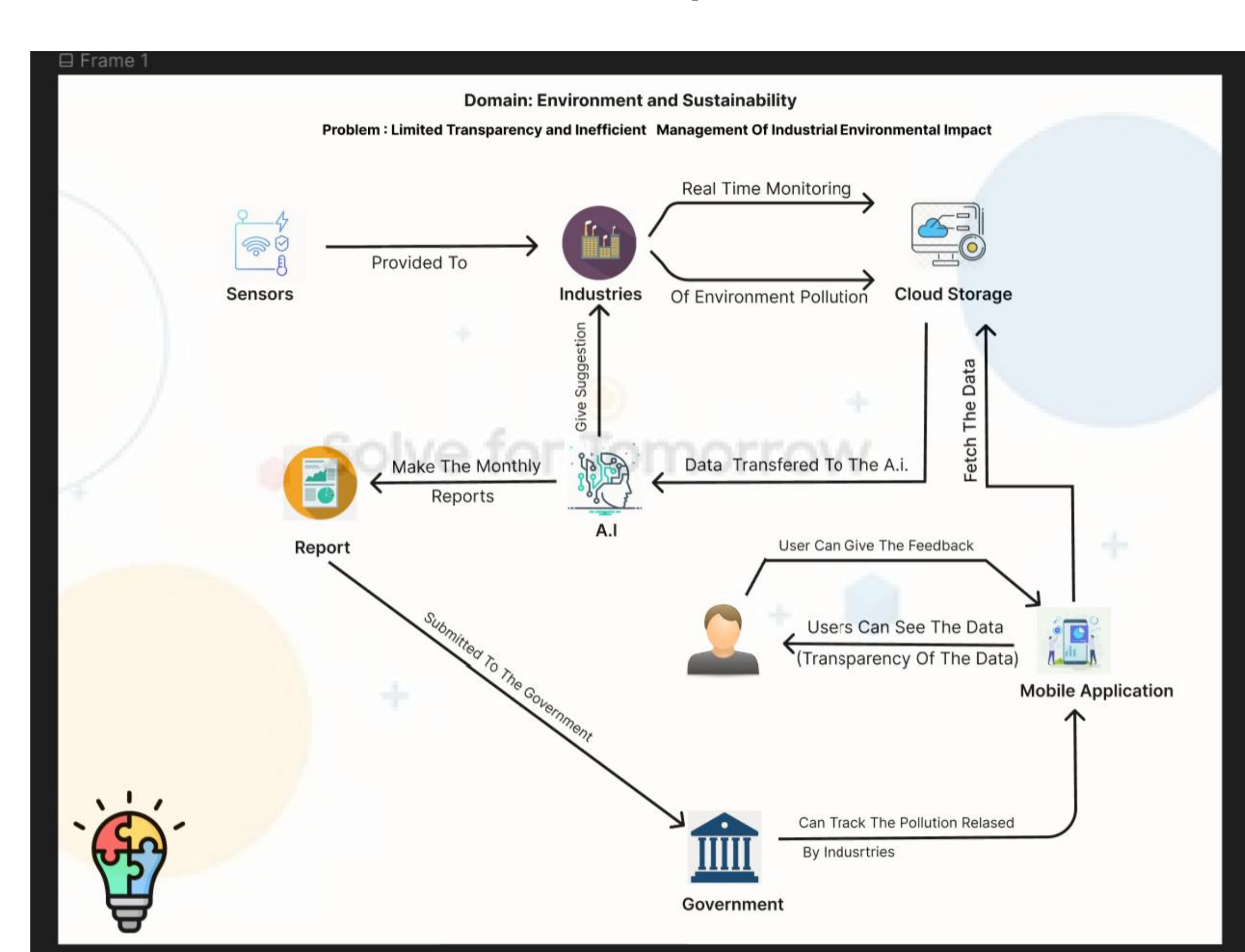
Need of these solution :

The Indian Ministry of Environment and Forests has identified 64 industries that are considered to be under the “Red Category” which include tanneries, firecrackers, smelting plants of various metals and even animal slaughterhouses and oil refineries. All of the above factors eventually boil down to one very important aspect, which is the population.

the world’s most polluted 30 cities, 22 are in India, according to research by IQ AirVisual, a Switzerland -based group that gathers air-quality data globally, and Greenpeace. Pollution in urban areas is usually a mix of different factors – mostly traffic, fossil fuel burning power plants and heavy industries.

The acute lack of transparency in industrial pollution emission means that whatever little data or information is released will remain shrouded in a cloud of questions. Take for instance, what government refers to as “Grossly Polluting Industries”—those which are monitored through OCEMS primarily for the waste they dump into rivers, especially in the Ganga basin. As of July 2019, according to government records, of almost 2,500 GPs, as many as 89 percent were complying[22] with environmental standards. The state of Uttar Pradesh, with almost 1,100 GPs, has reported that 88 percent of these industries are complying with environmental norms; Bihar, with almost 100-percent compliance; and Haryana, where the Ganga’s tributary Yamuna flows, has a 98-percent compliance among 638 industries. The question thus is, if indeed compliance rate is this high, why then has there only been a marginal improvement[23] in the Ganga pollution levels.

Product Consumer Graph :



Questions :

- (1) Describe the problem within "Environment & Sustainability" that you are trying to solve (Max 300 words)
- (2) How is your idea different from the existing ones? (Max 100 words)
- (3) How will your solution related to "Environment & Sustainability" create an impact in the society? (Max 300 words).
- (4) Does your team have any experience in implementing this idea on-ground? (Max 200 words).
- (5) Describe, in detail, the solution you will provide to solve the problem (Max 500 words)