

RIC 7: Open Network for Public Commons (ONPC) - scaling IoT-based air quality networks to 100,000 locations in India

Lead Proposer

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List of Collaborators

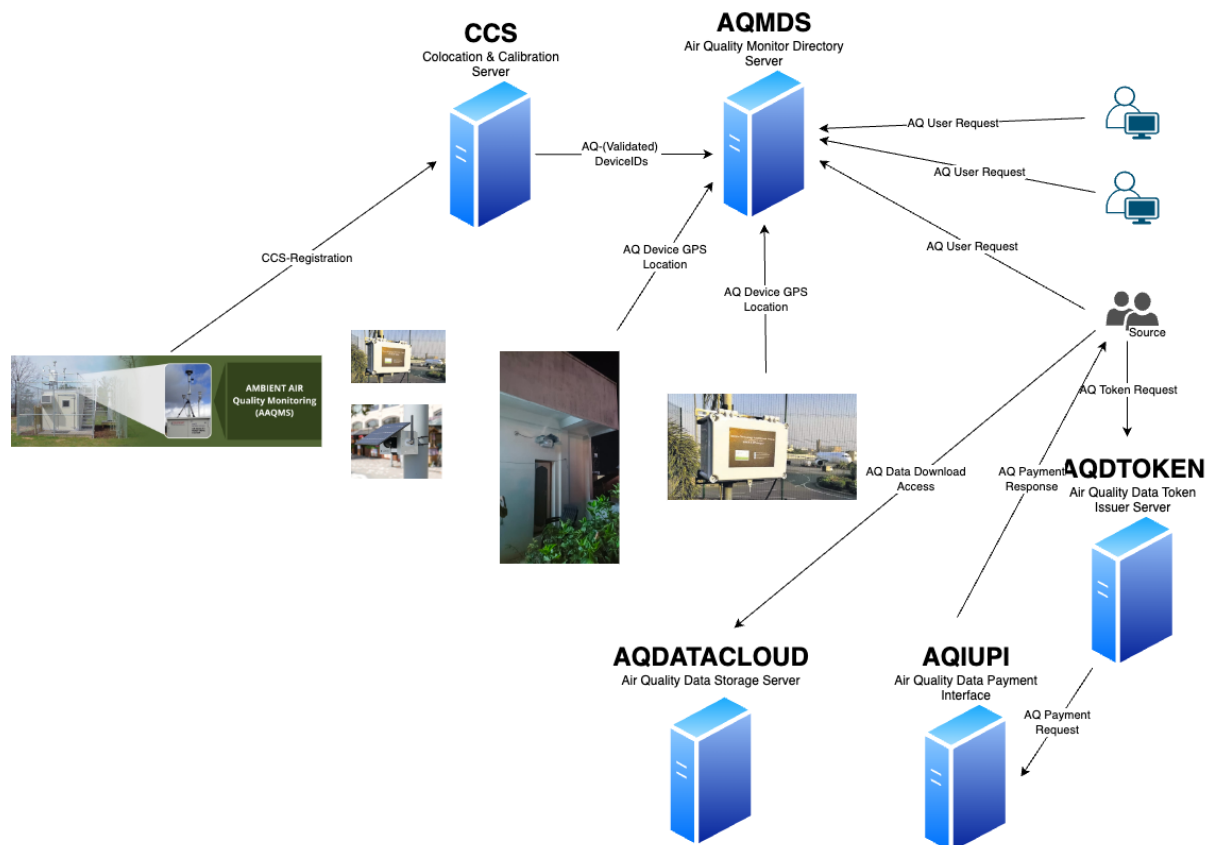
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Air pollution is one of the most urgent public health challenges of our generation. Nearly 1.2 million fatalities and over 20 million people have reduced quality of life due to ambient air pollution. Regulatory policies (National Clean Air Programme) in India has allocated over Rs. 4,000 Crore, over a period of 5 years, to deal with this challenge. Evaluation of these policies requires hyper-local monitoring of air quality across the country. Several other applications (real-estate/urban planning/agricultural insurance, etc) lack access to reliable spatial and temporal air quality datasets. The current air quality network of the country run by the Government, uses equipment which costs over Rs. 1.5 Crore (US\$200,000) per monitoring site. This cost can be reduced by 1/10th using IoT/Machine Learning-Sensor based technology with the required level of scientific accuracy. An Open Network for Public Commons (ONPC) is proposed here which will allow any air quality sensor-device owner to join a network of scientifically validated data providers. An in-built authentication/tokenized payment solution can also provide compensation to AQ device owners for providing scientifically valid hyper-local air quality data. The above Open Network system can scale seamlessly to 100,000s of air quality monitoring locations and the micro-payments can ensure the entire network remains economically viable.

Structure of the RIC workshop

April - July: Fortnightly Zoom call to understand stakeholder interest & technical contributions

July 8 - Meeting Agenda

09:00 - 09:30	Opening remarks all RICs
09:30 - 9:45	Welcome and Collaborator Introductions
9:45 - 11:00	- Opening Remarks: - Current Technical & Scientific Challenges in Scaling Air Quality Networks in India - Government/Regulatory Challenges in Air Quality Networks - Proposed ONPC-led solution for Scaling AQ Networks
11:00 - 11:15	Break
11:15 - 12:15	Welcome and Collaborator Introductions
12:15 - 1:30	- ONPC-AQ Architecture & Protocol discussion - Technical Collaborators - Roles, Responsibilities & Takeaways

Collaborators attending:

- Ronak Sutaria & Kevin Joshi, Respirer
- Swagata Dey, Rajesh Shenoy; CSTEP
- Bhavya Sharma; WRI
- Vamsi; Aurassure
- Sujoy Saha, Prithviraj Pramanik; NIT Durgapur
- Manik Gupta, BITS Pilani
- Abhishek Jain, Swastha Alliance
- Sachin Chauhan, IIT D
- Sunil Sardar, Revati Shidhaye; MCGM

- Shardul Manurkar; Gokhale Institute Pune
- Mohammad Rafiuddin, Council on Energy, Environment and Water (CEEW)

Relevant Publications, Website, repositories

1. Startup: <https://www.respirer.in/>
2. Non-profit Think Tank - CSTEP: <https://caps.cstep.in/#/>
3. Publications from Lead Proposer - (Ronak Sutaria)
<https://scholar.google.com/citations?user=andqzIQAAAAJ&hl=en>
4. Publications from Collaborator - (Dr Subramanian, R)
<https://scholar.google.com/citations?hl=en&user=mBGzGv0AAAAJ>
5. Existing Academia-Industry collaboration: <https://iitk.ac.in/atman/>
6. Democratizing Air Pollution Data:
<https://news.microsoft.com/source/asia/features/democratizing-air-pollution-data-so-india-can-clear-its-cities-of-choking-smog/>
7. Infosys Prize 2023 in Computer Science on Sensor-based Air Pollution Data:
<https://www.infosysprize.org/laureates/2023/sachchida-nand-tripathi.html>
8. Kulkarni, Padmavati, Naveen Puttaswamy, Vignesh Prabhu, Pratyush Agrawal, Adithi R. Upadhyay, Sofiya Rao, Ronak Sutaria et al. "Inter-versus Intra-City Variations in the Performance and Calibration of Low-Cost PM2.5 Sensors: A Multi City Assessment in India." ACS Earth and Space Chemistry 6, no. 12 (2022): 3007-3016.