



1. Context of the problem

Water, sanitation, and hygiene (WaSH) in public spaces contributes to better health and social outcomes. The recent COVID19 epidemic and its spread has made people aware of the importance of hand sanitation and washing. However, the communities in lower socio-economic strata of the society continue to bear the brunt of “sanitation stigma” where we believe that just because people are poor, they don’t follow good hygiene. This has already led to several jobs being lost and several that will continue to be lost even after this emergency phase is over. ***There is a need for solutions that can ensure everyone is following sanitation protocols and measures its adherence.*** This kind of technological solution can provide data to the service industry of how their employees follow the sanitation protocol and ensure quality, safe and healthy environments and products for their customers. We believe that the next decade will see an increased incidence of sanitation related epidemics. ***Solutions that measure level of sanitation and provide a digital footprint of each user adhering to the sanitation requirement will ensure community health and prevent unnecessary stigma associated with poor sanitation which inherently impacts the people from lower socio-economic groups.***

2. Description of the solution

Specifically, we have built three inter-connected systems that together offer a measurable adherence number when it comes to sanitation

- I. **A Hand Sanitation Station.** This system uses IoT Sensors (Gas Sensors) and Artificial Intelligence to quantify the level of hand sanitation. The system does not provide access when hands are not properly sanitized.
- II. **A Glove Detection System.** Many employees are required to wear gloves. Right from the pantry boy, street food vendor to paramedics, doctors and nurses’ everyone is required to wear gloves. But we often see deviations from this policy which can spread infection. Our AI based system uses a camera and underlying computer vision algorithms to detect if a person has worn gloves. This system is coupled with person identification through RFID or other means to develop a record of their glove wearing. Such a system can bring sanitation assurance to public environments such as offices, hospitals, restaurants and homes.
- III. **A Mask Detection System.** As with a glove, several employees are required to wear a mask, and this will continue and strengthen both during and post COVID19. We have developed an AI based computer vision mask detection system that can accurately detect masks worn and link it with a persons’ records. The full system operations are as follows. A users’ identity can be established through existing systems like the biometric readers, RFID cards etc. if needed. We then enable the user to sanitize their hands through sanitizer and ensure through our sensors and neural network that their hands are properly sanitized. This gives access if adequate sanitation is achieved. In a low risk situation, this stage is enough to give user the access to offices or next stage of operation we deem fit. For high risk environments we also want to ensure that adherence involves glove detection and mask detection. Using an Android Phone or a standalone system with camera, we can detect if the user is wearing gloves and masks and record that in an adherence database.

Audit logs would be available in the case of diseases which can enable better management of disease spread and care. API’s are also available for user sanitation ratings and usage alerts.

3. Segment of the population it will serve

Our system is designed for everyone in every public space. If it’s a park, our system ensures that everyone entering the park to have their hands sanitized and recorded (maybe with or without their identity). In an isolation ward, every ward boy or nurse or doctor needs this system first to properly know they have achieved the optimum levels of sanitation by hand sanitation and then wear a mask and glove. While the system is made for everyone it will significantly improve the working conditions of people from lower socio-economic groups. They are often blamed for lack of sanitation and the impact of such practices. Many will lose their jobs after the COVID19. By introducing objective measurement into the sanitation assurance, our DSAS system will ensure that everyone has the dignity of sanitation records. ***Our system will have two advantages: one lesser complications due to lack of sanitation and two lesser stigma due to this objective system ensuring that all users irrespective of their status sanitize and adhere as per requirements.***