

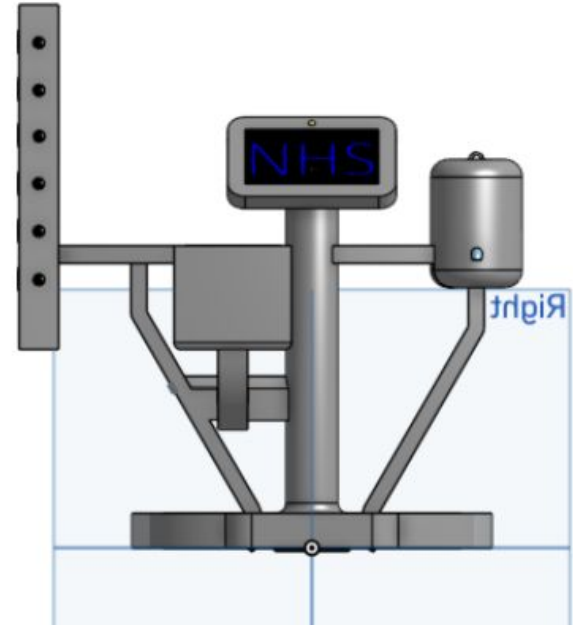


The D.I.P. Machine

What is DIP?

I have designed a hands-free coronavirus checkpoint, called the Disease and Infection Prevention machine, or DIP. Its purpose is to regulate, monitor, and help prevent the spread of COVID-19 and other infectious diseases through the use of data whilst simultaneously aiding immediate and practical infection prevention measures.

DIPs would be placed at the entrances to large public venues such as shopping centres or sports stadiums. The body of the machine would be manufactured from aluminium because it is strong, non-corrosive and relatively lightweight.





Why is it important / useful to society

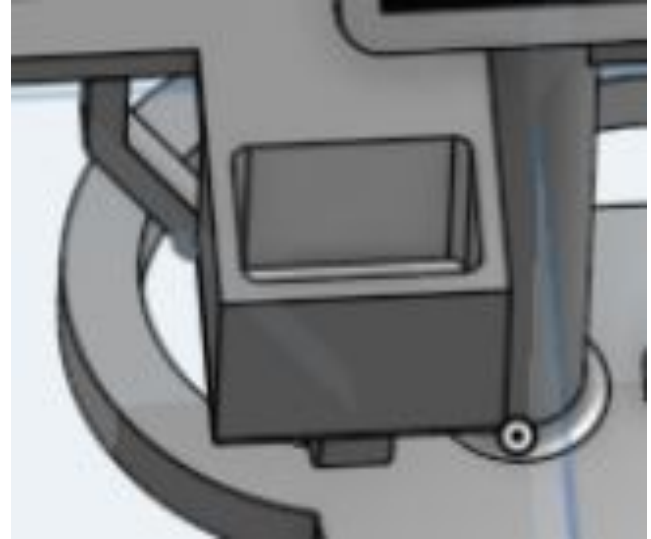
As we move on from the Covid-19 pandemic, we will have to rethink the way we run our society. Before the virus, many of our social habits were quite unhygienic. Standing in long, packed queues for sports games or to get into certain shops is just asking for disease to spread, but we thought nothing of it. People would happily travel to work, school, etc. whilst suffering from transmissible diseases such as the common cold. This is unnecessary and unhygienic and yet could, I believe, be largely eradicated from our society. I believe that after Covid, this behaviour will and should be less socially acceptable.

Public Health England announced in February this year that not a single case of influenza had been recorded. This is most likely due to sanitation and hygiene measures put in place because of Covid-19. Looking ahead, I believe that several of our Covid prevention measures should be kept in society to limit the spread of other infections.

Public health officials need to be able to build awareness and help shape public attitudes, focus funds and resources and target specific outbreaks of infection. DIPs will provide useful information about how many people are visiting which venues as we come out of lockdown. It will also give an insight into how many people are infected with a disease but are still going outside and mixing with other people. This knowledge could help the government choose which areas need the most funding to advance public hygiene systems. Scientists could analyse data from specific demographics and specific types of venues and this in turn could help government formulate policy. For example, if the data showed that a large number of people visiting sporting events were probably infected and chose still to mix and not wear a mask, then the government could more accurately focus awareness and education campaigns.

Wear a Mask

If a visitor does not have a mask but might be infectious, this device will be loaded with a small number of recyclable masks. However, for the compartment to be unlocked the visitor must pay a small fee for not having their mask. This would encourage people to keep a mask handy and reduce waste. The lid for this compartment would be made of clear perspex, and would automatically be locked/unlocked by the computer inside DIP.



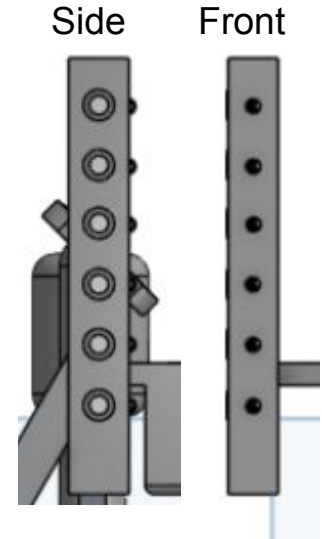
Sanitisation

Before entering the venue, the device will ask the visitor to make use of the automated hand sanitiser dispenser. Similar to automated hand-dryers and taps, the device will be equipped with a motion sensor to ensure the sanitiser is dispensed correctly. This container would be made of strong plastic such as perspex/acrylic, with a screw-on lid to allow quick and easy refills.



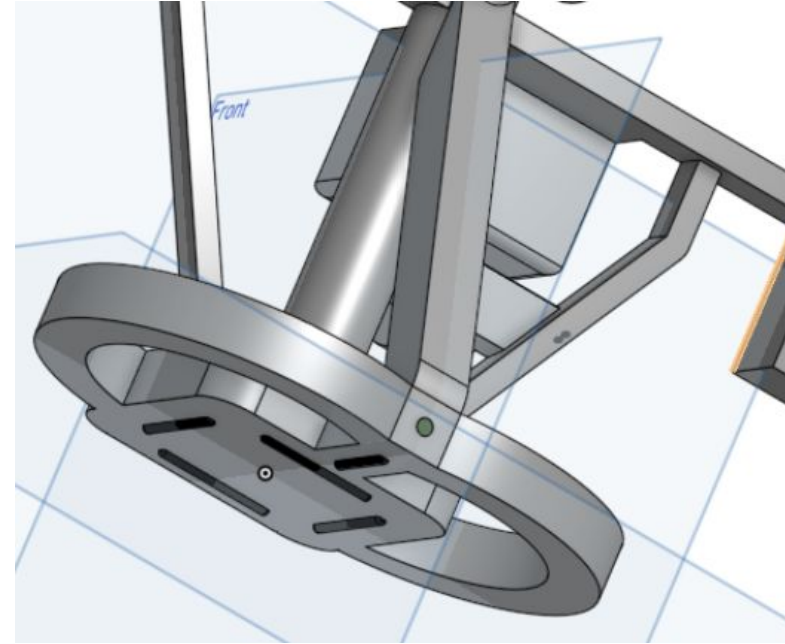
Temperature

The device is equipped with a set of temperature sensors. The user reads the number of the sensor that matches their height from the side of the machine and gives this number to the device when prompted on the screen. This is done through voice to avoid physical contact. The user will then be asked to put their forehead close to the selected scanner to allow the device to measure their temperature. If the reading is unusually high, then the device will inform the user and ask them if they have displayed any of the Covid-19 symptoms. All of this information will be sent to the NHS app. If the device believes that the user might be infected, then it will ask them to get a lateral flow test and return home. All of the scanners would be infrared scanners, meaning that they would not and could not be covered with a protective layer of glass/plastic, etc. These scanners can however, be weatherproof.



Power

The device receives power through a cable in the back of the base. This avoids the messy laying of cables across the floor in front of the venue. The device also has rubber strips around the base to increase grip and avoid scratches from rough floor surfaces. The inlet would most likely be wrapped with a shaped piece of rubber to guarantee no water damage.



User Interface

The device is equipped with a large screen to tell the visitors what they need to do. It provides instructions about how to use the temperature test, how to claim a recyclable mask, and how to use the hand-sanitiser dispenser. When the visitor is ready to enter a venue, it will display a QR code on the screen. When scanned by the visitor's phone, information will be sent to the NHS app (not the track and trace app) to allow a more accurate analysis of national pandemic data. The screen would be constructed with perspex because it provides a nice, clean finish as well as being strong. It would also be waterproof (especially useful if the device needed to be outside). This enclosure would also have an IP66 rating of water and dust protection. (IP or International Protection code)





Privacy and App Integration

The user's privacy is very important. Information collected by the DIP machine would be sent to the NHS app on the user's phone. Assuming the government uses this app for the 'Covid Passport' then there will naturally be a large uptake on the app's use. The user can then open the app to see where they've been, how many times they have needed to buy a mask, and how many times they have recorded a temperature. A pop-up will appear asking for their consent to send this data (anonymously) to the NHS. This would show where people are going post-covid, how many people do not have masks, and how many people are recorded as ill around the country. The user does not need to give consent, and if they choose not to then all data will be kept private in the user's device. The NHS app is already capable of recording test results, your current vaccination record, and other medical information including prescriptions. Before sending off any information, it could cross-reference information from DIP with information it already has to create more useful and accurate data. For example, if DIP detects that you have a temperature but your app knows that you are taking antibiotics for tonsillitis or another non-transmissible disease, then this temperature warning could be discounted.



Design

I have included the [link](#) to the CAD design document of the DIP device - please use this to see a 3D view of the machine*



Summary

DIP machines will be very useful for our society. DIP machines are modular, and as and when new needs arise they can easily be incorporated at a low cost. Through integration with the NHS app, the machine's use does not need to be limited to the fight against CODIV-19. DIP can also potentially shape and change attitudes to health in our society. It of course cannot be compulsory, but it will help people to become more aware of the fact that their health can easily affect people around them as well. In addition to helping us through the current pandemic, DIP could help to make widespread seasonal diseases like flu and colds a thing of the past and it could help us to cope with the next major pandemic more efficiently. DIP will make our society healthier, happier, and more resilient to infection.