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PHASE 2: INNOVATION.
FORMAT: PROJECT.

NOISE POLLUTION MONITORING USING IOT

OBJECTIVE:

To analyse noise pollution monitoring over a particular place, analyse and to raise a awareness about noise pollution.

PROJECT DEFINITION:

We need to find the areas which are important places to plant the noise pollution monitoring devices.

We can look at the following factors:

- Noise levels: What are the average noise levels in the area? What are the peak noise levels? How do these levels compare to recommended noise limits?

- Sources of noise: What are the main sources of noise in the area? Are there any specific times of day or week when noise levels are highest?

- Impacts of noise pollution: What are the impacts of noise pollution on the local community? This could include things like sleep disturbance, hearing loss, and cardiovascular disease.

INNOVATION IDEAS:

To conduct noise monitoring over a particular place, you can follow these detailed steps:

1. Identify the purpose of the monitoring. What do you hope to learn from the data? Are you trying to identify areas where noise levels are above recommended limits? Are you trying to track the effectiveness of noise pollution control measures?

2. Select the appropriate monitoring equipment. There are a variety of noise monitoring devices available, including handheld sound level meters, noise monitoring stations, and smartphone apps. The type of equipment you choose will depend on your budget and the specific needs of your monitoring project.

3. Identify the monitoring locations. Where are the main sources of noise in the area? Where are people most likely to be exposed to noise pollution? You may want to place noise monitoring devices at a variety of locations to get a complete picture of the noise pollution situation in the area.

4. Conduct the noise monitoring. Be sure to follow the instructions for your specific noise monitoring equipment. Be sure to calibrate the equipment before and after each use.
5. Analyse the data. Once you have collected noise monitoring data, you can use a variety of methods to analyse it. You can create noise maps, track trends over time, and compare noise levels to desired db.
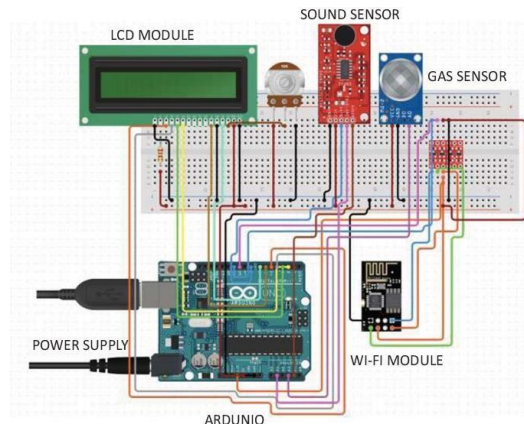
Here are some additional tips for noise monitoring:

- Be aware of the weather conditions. Wind and rain can interfere with noise measurements.

    Avoid placing noise monitoring devices near reflective surfaces, such as walls and buildings. This can distort the noise measurements.

    If you are using a handheld sound level meter, hold it at arm's length and point it towards the source of noise.

    Record the date, time, and location of each noise measurement.

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    Once you have analysed the noise monitoring data, you can use it to develop and implement noise pollution control strategies. For example, if you find that noise levels in a particular area are above recommended limits, you can work with the local community to identify the main sources of noise and develop ways to reduce them.

1. Consider the type of noise sensors you want to use. There are a variety of IOT noise sensors available, each with its own strengths and weaknesses. Some factors to consider include the accuracy of the sensor, its power consumption, and its cost.

2. Determine the number of sensors you need to deploy. The number of sensors you need will depend on the size and complexity of the area you are monitoring. As a general rule of thumb, you should deploy at least three sensors in each area.

3. Select the locations for the sensors. When selecting the locations for the sensors, it is important to consider the following factors:

   o The sensors should be placed away from direct sunlight and rain.

   o The sensors should be placed away from sources of interference, such as electrical equipment and large metal objects.

   o The sensors should be placed in locations where they can be easily accessed for maintenance.

4. Install the sensors. Once you have selected the locations for the sensors, you need to install them. This may involve mounting the sensors on poles or walls, or installing them underground.

5. Connect the sensors to the internet. Once the sensors are installed, you need to connect them to the internet so that they can transmit their data to a central server. This can be done using a variety of methods, such as cellular, Wi-Fi, or Ethernet.

6. Set up the central server. The central server will be responsible for receiving and storing the data from the sensors. You need to set up the server to collect and store the data in a way that is easy to access and analyse.

7. Analyse the data. Once the data is collected and stored, you need to analyze it to identify noise pollution hotspots and other trends. This information can be used to develop mitigation strategies and to raise awareness of noise pollution.

8. Identify the public areas where you want to deploy the sensors. This could include parks, playgrounds, schools, hospitals, and other areas where people are likely to be exposed to noise pollution.

IMPORTANT AREAS:

SCHOOLS   PARKS

TEMPLES   **HOSPITALS**

By following these steps, you can develop a plan to deploy IoT noise sensors in various public areas to measure noise levels. This information can be used to develop mitigation strategies and to raise awareness of noise pollution.

NOISE POLLUTION INFORMATION PLATFORM:

A noise pollution information platform is a website or app that provides information about noise pollution, including noise levels in different areas, the impact of noise pollution on human health and the environment, and ways to reduce noise pollution.

Noise pollution information platforms can be used by a variety of stakeholders, including:

- Individuals: Individuals can use noise pollution information platforms to learn more about noise pollution and how it affects them. They can also use the platforms to find out about noise levels in their area and to identify ways to reduce their exposure to noise pollution.

- Businesses: Businesses can use noise pollution information platforms to learn about the impact of noise pollution on their employees and customers. They can also use the platforms to identify ways to reduce noise pollution in their workplaces and in the communities where they operate.

- Governments: Governments can use noise pollution information platforms to raise awareness of noise pollution and to develop and implement policies to reduce noise pollution.

Here are some examples of noise pollution information platforms:

- Noise Tube: Noise Tube is a crowdsourcing platform that allows people to collect noise data using their smartphones. The data from Noise Tube is used to create noise maps and to identify noise pollution hotspots.

- World Health Organization (WHO) Noise Pollution Information Platform: The WHO Noise Pollution Information Platform provides information about the impact of noise pollution on human health and the environment. The platform also provides tips on how to reduce noise pollution in the home, workplace, and community.

Here is an steps of how IOT sensors could be used to send data to a noise pollution information platform:

1. The IOT sensors are installed in various public areas, such as parks, playgrounds, and schools.
2. The IOT sensors are connected to the internet using a cellular network.
3. The IOT sensors use the MQTT protocol to send data to the noise pollution information platform.
4. The noise pollution information platform receives the data from the IoT sensors and stores it in a database.
5. The noise pollution information platform processes the data to create noise maps and track changes in noise levels over time.
6. The noise pollution information platform provides information about the impact of noise pollution on human health and the environment to users.

This is just one example of how IOT sensors could be used to send data to a noise pollution information platform. There are many other ways to implement this system, and the best approach will depend on the specific needs of the community.

Noise pollution monitoring is an important tool for protecting public health and well-being. By monitoring noise levels, we can identify areas where noise pollution is a problem and develop strategies to reduce its impact.

This are the some of the ideas to implement the noise pollution monitoring in innovative steps according to our needs.

TABLE FOR PERMISSIBLE LEVEL NOISE:

TYPE OF AREA	DAY TIME	NIGHT TIME
INDUSTRIAL AREA	75	70
COMMERCIAL AREA	65	55
RESIDENTIAL AREA	55	45
SILENCE ZONE	50	40

According to the table data we can be able to design the software for noise pollution monitoring in the various places.

The value mentioned in table value can be helpful for finding the noise patterns, high-noise areas and potential sources.

CONCLUSION:

Data analytics is a powerful tool that can be used to identify noise pollution patterns and develop effective noise pollution control strategies. By using data analytics, we can reduce noise pollution and its negative impacts on human health and well-being.

A study in Delhi, India found that noise levels were highest near airports and busy roads. This information was used to develop noise pollution control measures in these areas.

Once noise pollution patterns have been identified, the data can be used to develop and implement noise pollution control strategies. For example, if it is found that noise levels are highest during rush hour in a particular area, traffic calming measures could be implemented to reduce noise levels.

As technology continues to advance, we can expect to see even more innovative mobile apps and devices for monitoring noise pollution and reducing its impact on human health and well-being.