3.3 IoT Configurations:

Now's the time to learn how to implement IoT device management. Here's a list of **5 actions** you must take if you want **your device to perform at its peak**.

1. Configure Your Device

Open the box, plug it in, and turn it on. You're not done here, though! You need to **properly set up the configuration** of your device. This helps to ensure your devices behave as intended within your IoT environment. You need to connect the sensors in need of calibrating and networking. If you have more than one, you'll need to account for that with group configurations.

2. Diagnose Your Device

Preventative maintenance is just what the doctor ordered. **Running routine diagnostics** on your IoT devices can help **detect potential problems** before they happen and cause downtime. Usually, devices come with diagnostic software from the manufacturer. The manufacturer has guidelines to tell you how often you should run the diagnostics, so you can follow these.

3. Apply Maintenance

For optimal performance, maintaining your devices is key. The diagnostic software will give you **insights into what you might need** to update, replace, or fix. That way, you'll avoid breakdowns causing downtime. Devices have a lifetime, so you'll definitely need to enhance features, update firmware, etc. every now and then. The device manufacturer will also have suggestions on regular maintenance intervals.

4. Ensure Proper Authentication

You need to enable trust within your IoT environment. To make configuration changes, you'll need as an admin the proper credentials. That means you must **protect your device access** with the proper authentication measures. This helps **ensure your devices are trusted**. You also need to secure the network connected to prevent any bad actors from accessing your device or even worse your network.

5. Monitor Your IoT Devices

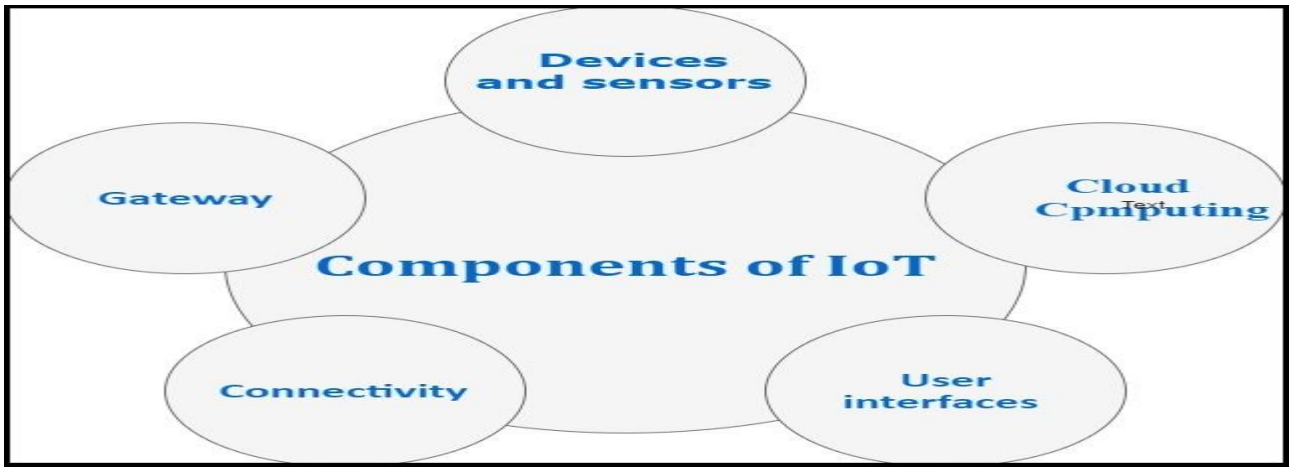
Your IoT device will always **provide real-time data.** It's crucial then for you to have the proper monitoring software in place. That way you can follow all the important data points. Monitoring also helps you **detect breaches, prevent failures, and fix problems** before they

cause any harm. If you notice something odd in your usual data, it's your sign to take some action and fix the problem.

3.4 Basic components:

There are the following components used in IoT:

- Devices and sensors
- Cloud Computing
- User interface
- Networking connection
- Gateway



Devices and sensors

Devices and sensors are the components of the connectivity layer. These smart sensors continuously collect data from the environment and transmit it to the next layer. For example, our phone is a device with multiple sensors such as GPS, camera, motion, etc.

The latest techniques in semiconductor technology enable intelligent micro-sensors to be produced for various applications.

There are some common sensors are as follows:

- Temperature and thermostats sensors
- Pressure sensors
- Humidity / Moisture level
- Light intensity detectors
- Moisture sensors
- Proximity detection

- RFID tags

Cloud Computing

IoT systems send huge data from devices, and these data must be managed efficiently to generate meaningful results. IoT technology uses the **cloud** to store a large amount of data. It provides tools for collecting, processing, and storing data. The data is easily available and accessible remotely through the internet. It also provides a platform for analysis. The IoT cloud is an advanced network of high-performance servers for high-speed processing of large amounts of data.

User interface

User interfaces are the physical and visible part of the IoT system accessible to users. User interface design is more important in today's competitive market, as it often allows the user to choose a particular device or appliance. Users will be interested in buying new smart devices if it is effortless to use and compatible with current wireless standards.

Modern technology offers a lot of interactive design to facilitate complex tasks in simple touch screen controls. Multi-colored touch screens have replaced the hardware switches on our devices, and the trend is on the rise for almost all smart home devices.

Networking connection

Internet connectivity is required for communication. Internet connectivity provides an IP address to each device. Although fewer addresses are depending on the IP address.

But this IP address is no longer sufficient due to a large number of uses in devices. As a result, researchers find an alternative to the IP address system to represent each physical device.

Gateway

IoT Gateway manages bi-directional data traffic between different networks and protocols. Another function of the gateway is to translate different network protocols and to ensure the interoperability of connected devices and sensors.

The IoT gateway provides a certain level of security for the network and data transmitted with higher-order encryption techniques. It acts as a middle layer between the devices and the cloud that protects the system from malicious attacks and unauthorized access.

Gateways can be configured to pre-process collected data locally from thousands of sensors before forwarding them to the next step. In some cases, it would be necessary due to the compatibility of the TCP / IP protocol.