

Introduction to the Internet of Things or (IoT) Aka-SMART DEVICES

The 'Thing' in IoT can be any device with any kind of built-in sensors with the ability to collect and transfer data over a network without manual intervention. The embedded technology in the object helps them to interact with internal states and the external environment, which in turn helps in the decision-making process.

IoT is a concept that connects all devices to the internet and lets them communicate with each other over the Internet. IoT is a giant network of connected devices – all of which gather and share data about how they are used and the environments in which they operate.

By doing so, each of your devices will be learning from the experience of other devices, as humans do. IoT is trying to expand the interdependence in humans- i.e., interact, contribute, and collaborate with things. I know this sounds a bit complicated but let us understand this with an example.

A developer applies a document containing the standards, logic, errors & exceptions handled by him to the tester. Again, if there are any issues Tester communicates them back to the Developer. It takes multiple iterations & in this manner, a smart application is created.

Similarly, a room temperature sensor gathers the data and sends it across the network, which is then used by multiple device sensors to adjust their temperatures accordingly. For example, the refrigerator's sensor can gather data regarding the outside temperature and accordingly adjust the refrigerator's temperature. Similarly, your air conditioners can also adjust their temperature accordingly. This is how devices can interact, contribute & collaborate.

The Benefits of IoT

Since IoT allows devices to be controlled remotely across the internet, thus it created opportunities to directly connect & integrate the physical world to the computer-based systems using sensors and the internet. The interconnection of these multiple embedded devices will result in automation in all fields and enable advanced applications. This results in improved accuracy, efficiency, and economic benefit with reduced human intervention. It encompasses technologies such as smart grids, smart homes, intelligent transportation, and smart cities. The major benefits of IoT are:

Improved Customer Engagement

IoT improves customer experience by automating the action. For, any issue in the car will automatically be detected by the sensors. The driver, as well as the manufacturer, will be notified about it. Till the time the driver reaches the service station, the manufacturer will

make sure that the faulty part is available at the service station.

Technical Optimization

IoT has helped in improving technologies and making them better. The manufacturer can collect data from different car sensors and analyze them to improve their design and make them much more efficient.

Reduced Waste

Our current insights are superficial, but IoT provides real-time information leading to effective decision-making & management of resources. For example, if a manufacturer finds fault in multiple engines, he can track the manufacturing plant of those engines and rectify the issue with a manufacturing belt.

IoT Across Various Domains

Computer Application

Every IoT device has software that can be accessed from a computer or mobile device using a web browser or web-based application through a wired or wireless connection via the World Wide Web (WWW) commonly known as the Internet. This connection medium provides real-time access to the IoT device 24 hours a day, 7 days a week, 365 days a year, in other words, the IoT device is

always on unless the power goes on for a brief period. When the power goes out most if not all these devices can remain configured and will automatically reconnect once the power is restored.

Mobile Hardware Technology

Cell Phones

Tablet Computers

Home or Office Hardware Technology

Desktop Computers

Laptop Computers

Energy Applications

The energy rates have risen to a great instinct. Individuals and organizations both are searching for ways to reduce and control consumption. IoT provides a way to monitor not only the energy usage at the appliance level but also the house level, grid level, or could be at distribution level. Smart Meters & Smart Grids are used to monitor energy consumption. It also detects threats to system performance and stability, which protects appliances from downtime and damage.

Energy Hardware Devices

Thermostats

Smoke Detectors

Carbon Monoxide Detectors

Refrigerators

Healthcare Applications

Smartwatches and fitness devices have changed the frequency of health monitoring. People can monitor their health at regular intervals. Not only this, now if a patient is coming to the hospital by ambulance, by the time he or she reaches the hospital his health report is diagnosed by doctors and the hospital quickly starts the treatment. The data gathered from multiple healthcare applications are now collected and used to analyze different diseases and find a cure.

Healthcare Devices

Smart Watches

Heart Rate Monitors

Weight Scales

Body Mass Index

Blood Pressure Cuffs

Education

IoT provides education aids that help in filling the gaps in the education industry. It not only improves the quality of education but also optimizes the cost and improves management by taking into consideration students' responses and performance.

Government

Governments are trying to build smart cities using IoT solutions. IoT enhances armed force systems and services. It provides better security across borders through inexpensive & high-performance devices. IoT helps government agencies to monitor data in real-time and improve their services like healthcare, transportation, education, etc.

Air and Water Pollution

Through various sensors, we can detect pollution in the air and water by frequent sampling. This helps in preventing substantial contamination and related disasters. IoT allows operations to minimize human intervention in farming analysis and monitoring. Systems automatically detect changes in crops, soil, environment, and more.

Transportation

IoT has changed the transportation sector. Now, we have self-driving cars with sensors, and traffic lights that can sense the traffic and switch automatically parking assistance, give us the location of free parking spaces, etc. Also, various sensors in your vehicle indicate the status of your vehicle, so that you do not face any issues while traveling.

To learn more about how smart and connected devices and its benefit [contact us](#).