

List out 20 use cases of the Internet of Things.

Smart Factories

Enterprise Asset management:

Enterprise asset management involves: work management, asset maintenance, planning and scheduling, supply chain management and environmental, health and safety (EHS) initiatives. Businesses collect real-time data from an asset with IoT sensors.

Industrial process automation/optimization:

Organizations can keep a real-time record of the metrics of all the machines inside a plant using IoT and IP networks. Manufacturers can use this data to automate workflows and to optimize production systems. Automation and optimization support industrial companies to reduce costs and increase the quality and volume of output.

Energy Management:

IoT devices can help manufacturers manage energy consumption based on real-time data collected from devices. Intelligent energy management systems reduce energy bills, operational expenditures and carbon footprint of the factory while increasing energy efficiency. WebNMS is an IoT platform that provides IoT applications including energy management to optimize the energy consumption of businesses.

Smart Cities

Outdoor surveillance:

When IoT CCTV cameras combined with artificial intelligence and machine vision, governments can automate surveillance of streets through cameras. As IoT enables connectivity of machines, they are able to record and analyse video data in real time, and they can provide police officers with insights instead of single pieces of images.

Smart lighting:

Smart lighting is made up of street lighting with IoT sensors. Sensors collect data about the condition of traffic and pedestrians. With that data, street lights provide optimum lighting so that street lighting systems can save up to 80% of the energy.

Electronic Road Toll Collection and Traffic Management:

Traffic engineers augmented by smart systems at a central traffic management center (TMC) can analyze data from IoT sensors then optimize timing of traffic lights throughout the day. This can help divide the traffic more evenly over roads as traffic volume fluctuates.

Smart parking:

Working principle of smart parking is:

- Sensors are attached to parking lots to detect parked cars
- Measurements are periodically sent to the cloud by microcontrollers
- Mobile Apps use cloud data to identify empty parking spaces,
- Drivers check mobile apps to identify vacant parking spaces close to the location they aim to go to.

Noise Monitoring:

In smart cities, sound monitoring systems can monitor noise levels and warn companies that violate limits and help manage noise levels.

Structural Health Monitoring:

IoT allows remote collection of architectural data to monitor events such as vibrations and changes in material conditions, predict structural damage, and prepare action plans for structures such as bridges, buildings, stadiums, ships, airplanes, etc.

Water Management

Due to the drastic increase in urbanization levels and the importance of water quality in human health, water management is a key topic for cities. A water management system is based on real-time data collected from sensors. Water management can provide the following applications:

Water conservation:

Sensors detect the water level in tanks and alerts when the water level is lower than the threshold. Well™, a smart home water conservation system developed by Mindtribe, uses IoT sensors to monitor water usage.

Smart Irrigation:

IoT sensors determine the weather condition and the soil moisture, which will help in getting the appropriate amount of water that soil needs. Bosch offers an IoT solution that measures how much water the tree needs and provides that amount of water.

Leakage Management:

IoT sensors can detect temperature changes, water leakage, chemical leakage, and pressure level in water tanks.

Water Quality Management:

IoT sensors determine what kind of chemicals are in the water. They also identify metrics such as total dissolved solids (TDS), bacteria, chlorine, electrical conductivity, etc.

Digital Health

Fall Detection:

Falling into the ground and not being able to get up or request help can be a scary experience for senior citizens. IoT sensors can detect falls using geolocation data and summon help so that it reduces the time the elderly remain on the floor after a fall which could lead to lethal consequences.

Companion Robots:

A companion robot is a robot that is designed to create companionship mostly for elderly and single children. IoT sensors are essential for robotics and it is the same for companion robots as well. Sensors detect objects that surround the robot and enable the robot to move.

Medical Fridges:

Medical fridges monitor the temperature of vaccines, medicines and organic elements for clinics and health centers. Medical fridges provide an opportunity to follow all safety standards and national regulations of the pharmaceutical market using IoT sensors. They prevent medicines and vaccines from spoiling. Efento is an IoT sensor and

IoT platform vendor that has a variety of temperature measurement products along with wireless monitoring of temperature in medical refrigerators.

Patient Surveillance/Remote Patient Monitoring:

20% of patients who had surgery are readmitted to the hospital within just 30 days. Remote patient monitoring (RPM) systems use wearables to monitor the condition of patients who are resting at home after surgery. RPM enables real-time data collection about patients' body temperature which is the main indicator of infections. With RPM, doctors can observe patients' data and provide early diagnoses without requiring patients to be physically present at the hospital. Telit is an IoT solution vendor and offers its customers a remote patient monitoring (RPM) solution that enhances patient monitoring capabilities and patient satisfaction.

Smart Retail

Supply Chain Control:

IoT devices have transformed supply chain management. Sensors, which are attached to storage containers or to products themselves,

- show the location of goods using GPS,
- track the speed of movement providing an accurate estimated time of arrival (ETA) for goods,
- monitor warehouse conditions such as temperature, humidity, light intensity, and other environmental factors

Near Field Communication (NFC) Payment:

NFC enables contactless payments. POS vendors include NFC support in their systems, and customers are adopting contactless payments via their smartphones.

Layout Optimization:

Sensors in the store collect data like voice, image or video to better understand customer habits and preferences. Retailers can get insights to redesign the layout of their stores. The optimized layout can enhance sales.

Smart Product Management:

IoT sensors enable retailers to control the rotation of products on shelves and warehouses to automate merchandising decisions. We have already written about retail analytics use cases, feel free to check it out if you want to learn more.

Smart Workplace

Sociometric badges:

Sociometric sensors are wearable IoT devices that measure the amount of face-to-face interaction, conversational time, physical proximity to other people, and physical activity levels using social signals derived from vocal features, body motion, and relative location. For example, Humanyze is a vendor that uses sociometric sensors to perform people analytics. The company helps organizations understand how their teams interact to increase performance.

Smart Metering

Smart Grid: With the increasing attention regarding climate change and carbon emissions, utilities focus on reducing energy consumption. For utility companies, IoT enables remote data management and monitoring capabilities to manage better power flows into and out of their grids, and give users the insights needed to understand their energy infrastructure investments.

Smart Logistics

Fleet Tracking

IoT fleet tracking systems improve security and provide precise and complete reports that give the fleet managers full transparency towards the fleet's activities. Through GPS monitoring and geo-location tools, companies can track the location of their trucks, optimize routes and monitor their fleet utilization in detail. For instance, Canadian delivery service Sure Track Courier saved 6-10% per month on fuel costs by optimizing routes using IoT data from trucks.

Platooning

Platooning involves a group of self-driving trucks that follow a lead truck at high speed safely and efficiently. Trucks use IoT sensors so that each truck communicates with the other trucks to adapt its speed and braking accordingly.

Connected Vehicles

Sensors are enhancing vehicles along with AI and analytical capabilities. These sensors provide communication with the driver to supply useful information about other cars on the road and roadside infrastructure to the driver to help the driver make safer or more informed decisions. For example, these vehicles provide GPS enabled location detection feature that helps them detect traffic congestions.