

IOT AND SMART HOMES

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Introduction

Emerging technology that is making our world smarter is IOT (Internet of Things). Sensors, software, electronics and connectivity are embedded in IOT to do well by exchanging information with other devices, operator or the manufacturer. Without IOT the idea of connected world cannot be imagined. For instance Smart Home is IOT based. A smart home, also referred to as eHome is an environment for living that has highly advanced technology. Because smart home's daily activities are monitored by a computer. IOT enabled smart home environment consists of various things such as home appliances, lighting, computers, security camera etc. all connected to the Internet and allowing user to monitor and control things regardless of location and time constraint.

History

Way back in **1923, Le Corbusier (1887–1965) brilliant Swiss-born architect** described a house as "a machine for living in"- and slowly, during the 20th century, it turned to reality. Initially, the arrival of electric power started to alleviate drudgery from all kinds of domestic chores, including vacuuming the floor, washing clothes and dishes. Later transistors made electronics more affordable during 20th century. Home appliances started to control themselves using built-in sensors and programmers. Now, in 21st century, the vision of fully automated, **SMART HOME** is actually being realized. Internet made it all possible. It's easy to set up virtually any electric appliance in our home so that it can be controlled from a Web browser anywhere in the world. The net-connected gadgets talk to one another, help in our lives through what's known as the **Internet of Things**. Turning the lights off when we are away from home is the simplest application of smart home technology. Other sophisticated applications include remote monitoring tasks such as keeping an eye on elderly or vulnerable residents at our homes.

The Internet of Things

It's our ability to communicate with one another made people smarter than all the other creatures that creep, flap, hoof, and slither round the planet. We can talk to other people, listen and collaborate to resolve any complicated issues, from finding remedies for serious illnesses to sending astronauts to the Moon. Since age old, people were intricately networked round the world; even before the invention of Internet. How about gadgets and machines could talk to each other the same way? How about an accelerometer embedded in a cardigan could automatically detect if an old person fell down the stairs and telephone an ambulance? How about all the homes had smart power meters that could signal energy consumption to utility companies in real-time? How about if car engines could monitor their own mechanical efficiency, and, if it fell below a certain level, dial into a garage computer and be remotely tweaked back to some optimum level, all without leaving our drives? How about highway control systems could measure and monitor cars streaming down different routes at different times of day and automatically re-route traffic round jams and snarl-ups? All these things might sound wonderful, but definitely possible if the machines in our homes, offices, and transportation systems could communicate with one another automatically- by an Internet of things.

What is the Internet of Things?

Technology entrepreneur Kevin Ashton working in brand marketing at Proctor & Gamble originally suggested in 1999 this idea of IOT. He had been researching electronic sensors and **RFID** tags and wondered what would happen if all kinds of daily used objects and machines would communicate through computer network. **Ashton** realized his Internet of Things paves way for good execution in all kinds of businesses. In popular news articles, the Internet of Things is often explained by introducing a well known but perky and rather everyday examples, like if refrigerators could use RFID tags to detect what products it contained and how old they were. If it is linked to the Internet, it would automatically reorder new supplies whenever it needs. In case if this technology is used to monitor elderly or disabled people, they could live safely, with independence and dignity, in their own homes. It's easy to build a home that uses motion sensors to monitor when someone is regularly walking around (intruder alarms have been using this technology for years), and not much harder to monitor that data remotely. That's how the Internet of Things could prove really helpful to a society with a rapidly aging and challenging population. House safety could be automatically monitored while family is on tours, using sensors and webcams. If it works in a house, it works anywhere in the world like checking and restocking shelves in a supermarket, monitoring the crumbling concrete on a highway bridge, supervision of any projects under construction or for any other important activities.

Characterstics of IOT

IOT can be defined through the following fundamental characteristics

- ❖ **Connectivity:** Devices, sensors need to be connected: to an item, to each other, actuator, a process and to 'the Internet' or another network.

- ❖ **Things:** Anything that can be tagged or connected as such as is designed to be connected. From sensors and household appliances to tagged livestock. Sensing materials can be attached to devices and items.
- ❖ **Data:** It is the glue of the IOT, the first step towards action and intelligence.
- ❖ **Communication:** Devices get connected so they can communicate data and this data can be analyzed.
- ❖ **Intelligence:** The aspect of intelligence as in the sensing capabilities in IOT devices and the intelligence gathered from data analytics (also artificial intelligence).
- ❖ **Action:** The consequence of intelligence. This can be manual action, action based upon debates regarding phenomena (for instance in climate change decisions) and automation, often the most important piece.
- ❖ **Ecosystem:** The place of the Internet of Things from a perspective of other technologies, communities, goals and the picture in which the Internet of Things fits. The Internet of everything dimension, the platform dimension and the need for solid partnerships.

What Is Smart Home Automation?

As described earlier smart home technology connects devices, appliances, or systems into a common network that can be independently and remotely controlled. Home technology works together in one system will be referred as a “**connected home**”. For example, lights, TVs, audio speakers, security cameras, locking system, gadgets, thermostats, and all connected into a common system, can be controlled from smart phone or through a mobile touch screen device. Smart home automation allows tapping into high-tech functionality and luxury that wasn't possible in the past. Advancement in technological inventions, increases the possibilities for consumer home automation and makes life pleasant, enjoyable, and ultimately saves family resources. **SMART PHONES** were the boon of **2000** and in **2010** is **SMART HOMES**.

Advantages of Smart Home Automation

Following are a few amazing practical advantages to home automation.

- ✚ **All home devices can be managed from any place:** one needs to learn to use app on smart phone or tablet which enables to operate countless functions for various devices. Convenience is enormous.
- ✚ **New devices and appliances can be easily accommodated:** Advanced technology enables the arrival of latest gadgets and new models into the market as time goes on and Smart home systems help families to replace the old ones and add the latest ones into the home environment thereby making life wonderfully flexible and allows to upgrade to the latest lifestyle.
- ✚ **Improves security of homes:** Security and Surveillance features in your smart home net work maximizes home security. Home automation systems can connect motion detectors, surveillance cameras, automated door locks, and other tangible security measures throughout home so one can activate them from one's mobile device before heading to bed. One can also choose to receive security alerts on various devices depending on the time of day an alert goes off, and monitor activities in real-time whether one is in the house or around globe.

- ✚ **Household chores can be operated or controlled through remote:** From a distance household chores can be operated or controlled during peak loads periods. On an exceptionally hot day, one can order one's house to become cooler in just enough time before getting into home from work. If one is in a hurry to get dinner started but still at the store, one can order to start oven to preheat while still on way home. One can even check to see if left the house lights on, who is at the front door, or make sure whether turned off all media.
- ✚ **Improved energy efficiency:** Smart home technology makes it possible to make gadgets energy efficient. Programmable smart thermostats help to have more precise control over the heating and cooling of home as per family's schedule and temperature preferences and also suggest the best energy efficient settings. Lights and motorized shades can be programmed to switch to an evening mode as the sun sets or lights can turn on and off automatically when members enter or leave the room, so that never to worry about wasting energy. This is how it's possible to make more energy-efficient.
- ✚ **Improved device functionality:** Devices can be operated efficiently through smart homes. Smart TV helps to find better apps and channels to locate favorite programming. Smart oven assists cooking items to perfection without worrying about overcooking or undercooking. An intelligently designed home theater and audio system can make managing movie and music collection effortless when entertaining guests. Ultimately, connecting appliances and other systems with automation technology will improve device effectiveness and overall home life could be made much easier and enjoyable!
- ✚ **Household management insights:** IOT enables persons to improve ability to tap into insights on how our home operates. It helps to monitor on how often one watches TV and what one watches, kind of meals one cooks, the type of foods kept in refrigerator, and energy consumption habits over time. From these insights, one may be able to analyze our daily habits and behaviors, and make adjustments to live the lifestyle one desires.

Do we really need a smart home?

We might think the idea of a smart home is perky and impractical. It's awesome to have a machine switching the lights on and off though it can be done by us perfectly. Keep in mind, elderly and disabled people, and those with special needs that struggle with simple household tasks. Home automation could make all the difference between them being able to live happily and independently in their own home or having to move into expensive sheltered accommodation. Governments and charity homes are looking at home automation with increasing interest: hence the use of computers, robots, and other technologies support the help that vulnerable people need to keep them happy, healthy, and independent. For example, people with **dementia** can have their homes fitted with automated sensors that check whether cookers have been left on or taps have been left to overflow. It's highly advantageous to **Elderly people** who prone to falling can have their homes fitted with lighting activated by motion sensors, so that even if they get up in the middle of the night they're not stumbling around dangerously in the dark. **Blind people** can manage domestic chores with household appliances by using one simple computer controller programmed to suit their special needs. **Whether one is elderly or disabled**, home automation systems like this can make all the difference to be independent and improve quality of life. Obviously home automation improves home security, comfort, and

convenience. Most important, if energy monitors such as thermostats or sensors are incorporated it helps to cut the lights to unoccupied rooms thereby reduces household energy bills.

Summary

A smart home is a place that has highly advanced automatic systems for controlling and monitoring domestic life. IOT plays an important role in building smart home. Through IOT almost every object of our daily life in a home can be connected. IOT allows monitoring and controlling all of these connected objects regardless of time and location. IOT is a real boon in the lives of people with busy schedules, elderly and physically challenged. A smart home consists of many technologies through home networking for improving quality of living.

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