IoT: The 21st Century Problem Solver

Technology is rapidly evolving and changing our everyday lives. It's seen all around us — in our homes, in our offices, in our cars, even in the palm of our hands, almost impossible to escape! If you asked someone 200 years ago if they could foresee this future, they'd probably look at you like you're crazy. However, even with this advance in technology, why are we still solving problems like we did 10, 20, 50, even 100 years ago? Why aren't we using new tools available to us (technology) to solve these issues?
Our tendency is to think about solving problems the way we've always done them. But there's a completely different degree of complexity that's emerged here in the 21st century.
— Dr. Jonathan Reichental

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What is IoT?

IoT (the Internet of Things) refers to billions upon billions of devices that collect and share data. The Internet has successfully connected countless people, but now it's time that we connect physical, everyday objects too. Because of today's advanced technology, it's possible to turn anything into a device connected to the IoT.
Picture this: You're an at-risk patient and this new technology gives you access to a medical bracelet that monitors your heart rate, blood pressure and other vitals. This bracelet would not only collect this information, but your healthcare professionals would also have access to it. Anytime your vitals are low, your doctor could have access to it right away, and preform a diagnosis **without you even having to leave your bed.** Depending on how serious the case, your doctor could have an ambulance dispatched right away, and get you to the hospital in no time. This avoids cases where medics show up to the scene too late, or even having to pay monthly, or weekly visits to the clinic. This is one of the ways IoT could be so useful to billions of people.

Data collected by your IoT medical device is stored in a secure cloud, giving access to you, and your healthcare providers. Replacing inconvenient, long visits to the clinic with smart technology in the comfort of your own home.

IoT allows for worldwide data sharing, between you, your family, your doctors, your city, and even your dog could be connected to one another. IoT comes in many shapes and forms. Even your thermostat can be connected through IoT and learn about your temperature preferences, then lower the temperature when you're out, and raise it once you get back home. Saving you time and money.

IoT can solve countless problems we see on a daily basis. The sharing and collection of data allows technology to progressively become smarter as well, leading to even more advances are problems solved. IoT can create and connect SmartHomes, SmartCars, and even SmartCities. But how did we get to this point?

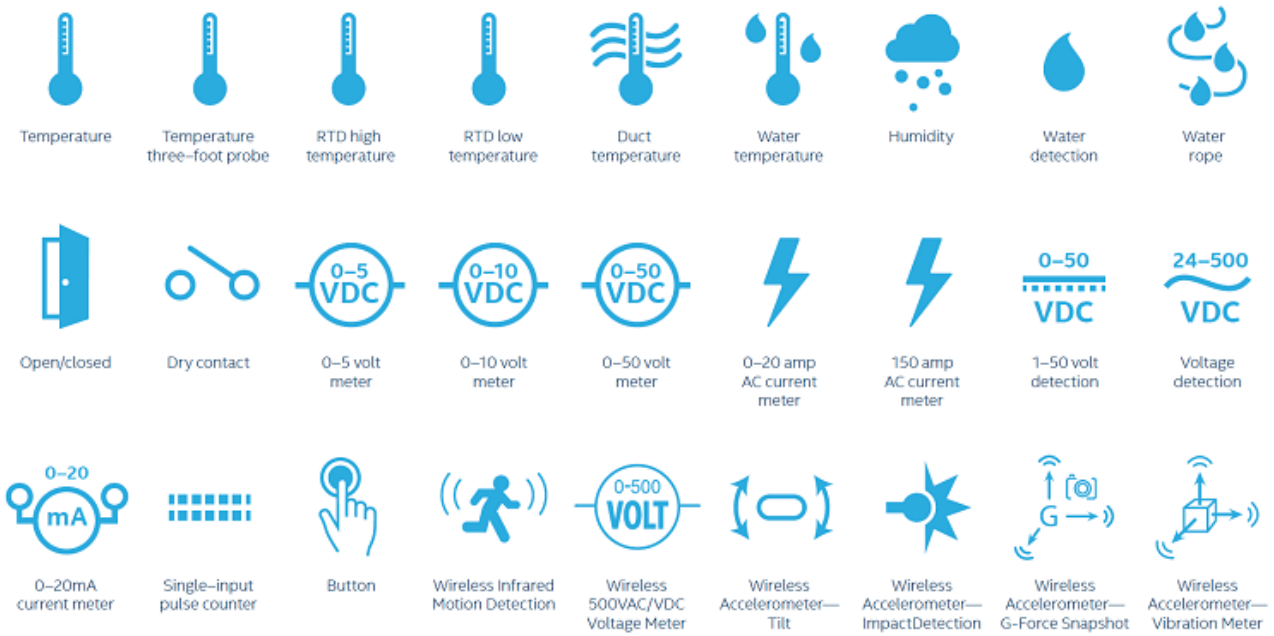
How Does IoT work?

Living things rely on their **senses** to navigate and understand their surroundings. Similarly, IoT devices use **sensors** to understand their surroundings, and collect data. However, IoT devices have way more sensors/senses than we do. With a variety of different sensors, IoT devices are becoming more and more powerful. Lets look at a couple examples.

- **Temperature Sensor:** This sensor (as obvious as it is), collects data on the temperature surrounding the area! Uses include SmartThermostats
- **Proximity Sensors:** These sensors are used to detect motion. They use electromagnetic waves to detect things like movement all the way to UV index! Primary uses of this sensor usually have to do with safety and security.

- **Optical Sensors:** Like us, this sensor allows a device to scan and collect visual data with light waves. They emit and receive these waves to create digital images! Optical sensors are used from cameras to chemical plants!
- **Pressure Sensors:** These sensors detect pressure in countless devices. They work by converting physical energy into electronic signals! An example of this is probably in your hand right now! If you have a newer model of the iPhone, the 3D Touch feature is a prime example of a pressure sensor.

These aren't nearly all of the sensors used today, but it's proof of how impressive this technology can be. The collection of data around the world with these powerful tools has the ability to change the world, and solve global problems. One of the most notable things we can change with IoT are cities themselves.



Examples of common IoT Sensors

Real World Application of IoT: Smart Cities

"What does technology mean for the city and the quality of life?"
— Dr. Reichental

There are tons of problems that affect citizens in the city on a daily basis, specifically in the downtown regions. With more and more people moving into urban regions each year, these problems are only bound to get worse. What can we do to solve these problems, or even avoid them altogether? IoT offers a promising solution.

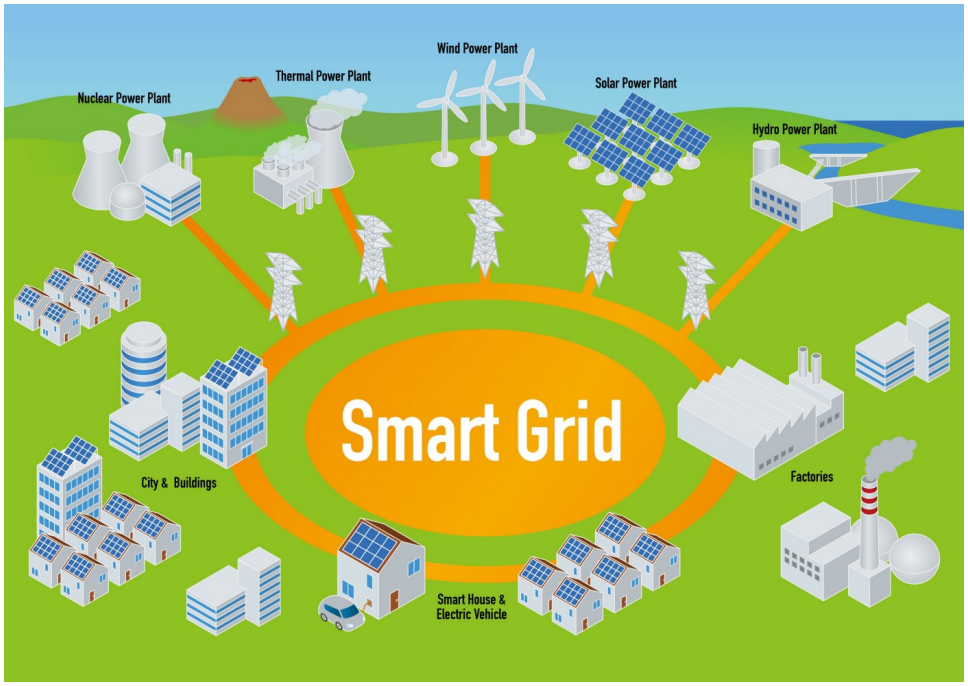
SmartCities connect every aspect of the city together. The data collected isn't stored away, however, all citizens would have access to it, improving their everyday lives.

One major issue concerning residents is traffic. Driving downtown is horrible, but it's a tough reality the majority of people. But did you know that one of the greatest causes of this never–ending back traffic is trouble **finding parking?**
Most of the traffic downtown is caused by people looping around trying to find a parking space. However, with IoT, this problem could easily be resolved. By implementing proximity sensors in parking spaces all around the city, this data can be collected and shared with drivers in the region. This way, instead of mindlessly searching for parking spaces, they would have access to real–time data letting them know where and which parking spaces are available.

SmartCities allow citizens to have access to real-time data on parking slots in the city. This avoids mindless circling through the city.

Another issue includes blackouts and power generator failures. Using a SmartGrid, millions of citizens could not only reduce their power usage (and help the environment), **but also prevent electrical failures.**

Like an electrical grid, a SmartGrid is connected to all electrical devices region–wide. However, when using SmartAppliances, such as dishwashers that use data from IoT clouds, **electricity can be more efficiently produced and distributed**. Think about peak energy usage times: If a SmartGrid collected data about the peak hours, your SmartAppliances could use this data, and run during off–peak hours, saving you money and reducing the probability of blackouts.



Energy sources connected with the city, local factories and your neighbourhood all in one.

Reducing energy consumption and evening out its distribution

Connecting cities and collecting data would make life better and simpler for all citizens. IoT's potential is unlimited, and is very promising for the future, in solving big issues.
I highly recommend you check out this video if you'd like to see what a real–life SmartCity could look like.

A Future to Look Forward To

Right now, IoT is still in early development, and we won't expect to see most of the world's cities transformed into SmartCities until 2050. However, smaller applications in the medical field and in your own home are already available today, such as Connected Inhalers, Amazon's Alexa, Google Homes, etc.
IoT is an emerging technology that is going to be able to change the world, and change how we solve global issues. 21st century problems require 21st century solutions, and IoT is one of them.