

INTERNET OF THINGS FOR DUMMIES

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Unlike the dull name, the prospect and scope of the Internet of Things is in reality big enough to change our world. Although this is not a new topic (the name was coined back in 1999) and there are implementations of it up and running already, the concept is still somewhat less popular in our parts of the world. This article aims at diminishing that.

WHAT IS IT?

As the dull yet self-explanatory name suggests, IoT is all about the network connecting every "thing" and any "thing" that we perceive and use. Now, what classifies as a "thing"? It can be the general appliances in our homes, the business products in a warehouse, the machines in a factory, the vehicles on the road, the food we eat, the animals we pet or even us. Humans interacting with these "things" over the internet is the very essence of Internet of Things.

There are quite a few existing systems in the IoT domain that we can see as examples. There's the Smart Home where you can remotely observe and control home appliances, electronics, the electricity, temperature and what not. There are also the smart watches that can be used for keeping track of your health.

HOW DOES IT WORK?

There are 4 steps to making an object part of the IoT.

Firstly, we have to identify the object, make it unique from different categories of objects and also from other objects of the same category. The perfect solution to this is IPv6. Internet Protocol version 6 is a 128 bit code, which mathematically allows 3.4×10^{38} unique variants of the code. This means that 3.4×10^{38} objects can be uniquely identified, which is practically an infinite amount.

Secondly, we need a network through which we can communicate with it. Fortunately, this thing called the internet has been invented.



Thirdly, the object needs to take data from its surroundings. This can be achieved using different sensors like heat sensors, pressure sensors, cameras, QR code scanners and many more.

Lastly, we need to control it. Processors need to be embedded in the objects that will enable us to send commands remotely which the objects will receive, process and execute.

WHY THOUGH?

The primary motivation is making life easier. Let's say it's early morning and the house help just cleaned your room while you were sleeping but forgot to turn the fan back on. Wouldn't it be more convenient to use your smart phone, which is of course right beside you, to turn on the fan instead of getting up and going to the switches? The examples are countless and

go beyond the scope of mere personal conveniences. There are manufacturing and financial benefits for big businesses where the maintenance of large amount of products are currently done by employees who are prone to errors. IoT is also beneficial in the field of health and medications, enabling remote patient monitoring that not only monitors the current state of a patient but provides warnings of critical conditions like heart attacks.

Security is another important aspect of implementing IoT. By keeping track of so many objects and even humans, the ability to prevent unwanted situations, from petty crimes to terrorist attacks, would be more efficient. Even if prevention is not possible detecting and catching the perpetrators will not be difficult anymore with devices and machines everywhere monitoring their users and keeping history.

There is another significance to IoT and it is concerned with data. The present world revolves around information about people, and these information come from countless data from everything everyone interacts with. The conventional process of acquiring these data depends on the input from ordinary people. But neither are people consistent nor careful enough for dependable data. With the use of IoT, data can be directly generated from the devices and objects themselves in no time. This massive influx of accurate data is all what the engineers need for, among many things,

the rapid development of powerful A.I.

IS THIS UTOPIA?

In terms of convenience and ease of living, yes, it will be a better world to live in. But the compromise may just not be worth it. Privacy will be hard to retain when everything you do and everything you use is being observed. With our virtual world already constantly in risk of getting mis-used, linking our physical world to the internet will only increase the risk of exposure. Hacks are equally dangerous to personal security. When the devices you are so dependent on can be controlled through the internet, who's to ensure that an outsider can't hack into your network and cause unforeseen havoc?

WHERE DO I SIGN UP?

Regardless of the arguments between risks and benefits, IoT is undoubtedly the obvious next step in human advancement. To pursue for a career in this field is not such a bad decision. Any major related to electrical or computer engineering and mathematics are gateways to IoT. Even if you're not in these majors, there are plenty of learning resources in the internet and cheap devices in the market to get you going. The time is now.

Fatiul Huq Sujoy is a tired soul (mostly because of his frail body) who's patiently waiting for Hagrid to appear and tell him, "Ye're a saiyen, lord commander." Suggest him places to travel and food-ventures to take at [fb.com/SyedSujoy](https://www.facebook.com/SyedSujoy).

