Internet of Things

Ritu Singh Kalsi

Assistant Professor, Dept. of Computer Applications, Post Graduate Govt. College for Girls, Chandigarh, India

Abstract: **The Internet of Things is a network of physical objects – vehicles, machines, home appliances, and more – that use sensors and APIs to connect and exchange data over the Internet. The "Internet of things" (IoT) is becoming an increasingly growing topic of conversation both in the workplace and outside of it. It's a concept that not only has the potential to impact how we live but also how we work. But what exactly is the "Internet of things" and what impact is it going to have on you, if any? Why does it matter? There's a reason the government is encouraging energy companies to hand you a smart meter: all that data and automated use is more efficient, meaning we use less energy. Many areas of IoT show such benefits, though some smart gadgets are more about whizz-bang effects than efficiency, which may well be why we're seeing more smart heating than smart fridges in the UK. There's a lot of noise at the moment about the Internet of Things (or IoT) and its impact on everything from the way we travel and do our shopping to the way manufacturers keep track of inventory. Simply put, this is the concept of basically connecting any device with an on and off switch to the Internet (and/or to each other). This includes everything from cell phones, coffee makers, washing machines, headphones, lamps, wearable devices and almost anything else you can think of. This also applies to components of machines, for example a jet engine of an airplane or the drill of an oil rig.**

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1. Internet of things

A. What is the Internet of Things?

We've been fascinated with gadgets that function on a grander scale for decades (think spy movie-type stuff) – but it's only been in the past several years that we've seen the IoT's true potential. The concept evolved as wireless Internet became more pervasive, embedded sensors grew in sophistication and people began understanding that technology could be a personal tool as well as a professional one. The term "Internet of Things" was coined in the late 1990s by entrepreneur Kevin Ashton. Ashton, who's one of the founders of the Auto-ID Center at MIT, was part of a team that discovered how to link objects to the Internet through an RFID tag. He said he first used the phrase "Internet of Things" in a presentation he made in 1999 – and the term has stuck around ever since. In a nutshell, the Internet of Things is the concept of connecting any device (so long as it has an on/off switch) to the Internet and to other connected devices. The IoT is a giant network of connected things and people – all of which collect and share data about the way they are used and about the environment around them. At its core, IoT is simple: it's about connecting devices over the internet, letting them talk to us, applications, and each other.

The popular, if silly, example is the smart fridge. What if your fridge could tell you it was out of milk, texting you if its internal cameras saw there was none left, or that the carton was past its use-by date? IoT is more than smart homes and connected appliances, however. It scales up to include smart cities– think of connected traffic signals that monitor utility use, or smart bins that signal when they need to be emptied – and industry, with connected sensors for everything from tracking parts to monitoring crops. With IoT adoption proceeding at a breakneck speed, it's a good idea to begin assessing how you can leverage the IoT in your future marketing. One impactful way to start is by optimizing your content for voice search, since Voice Search and Virtual assistants are already changing internet search habits at a rapid pace. As the Content Marketing Institute reports, 50 percent of consumers will interact with voice-activated technology by 2020.

2. Internet of things devices (IOT devices)

- *Amazon Echo:* This smart home hub is essentially a speaker that can listen to users and respond to commands, it can play music, answer questions, read audiobooks, deliver traffic and weather reports, control lights and thermostats, order pizza, order an Uber and much more. The company has also released a similar, lower-priced device called the Tap.

- *Awair:* A good option for people with asthma or allergies, Awair is an air-quality sensor that can send smartphone alerts and recommendations for improving your indoor air quality. It also has programs for improving sleep and productivity.

- Welkin WeMo: Belkin's WeMo is a complete line of home IoT devices that includes smart switches, cameras, lights, an air purifier, heater, slow cooker, humidifier and more. The company has partnerships with several other firms that allows end users to control a lot of different devices with one smartphone app.

- *Cinder:* Cinder's website describes this product as "a cross between sous vide, the high-end slow-cooking water bath method used by restaurant chefs, and the George Forman grill." It's a countertop grill that connects to your smartphone to make cooking fast and easy.

- *Ever sense:* Most smart thermostats allow you to control your home temperature with your smartphone.

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This one actually senses where your smartphone is and adjusts the temperature in each individual room accordingly. It works for multiple family members, keeping everyone comfortable.

- *Keen Home Smart Vent:* If your house is too hot in the bedroom and too cold in the family room, this device is for you. It opens and closes the vents in each room depending on the temperature in that area. It can also connect to Nest thermostats and smartphones. The first production run of the device sold out, but the company expects to have more available in the fall of 2016.
- *Nest:* Nest is best-known for its Internet-connected thermostat, but it also makes smoke and carbon monoxide detectors and cameras. Its products also integrate with IoT home automation products from a variety of other vendors.

A. Why the internet of things technology is here to stay

Luckily, there is more to the technology than perfect bagels and moody lighting. IoT goes beyond mere indulgence, although having a smart home equipped with cutting-edge smart devices is a delight to interact with on a daily basis, IoT can do far more. "IoT is transforming the everyday physical objects that surround us into an ecosystem of information that will enrich our lives," reads the esteemed PricewaterhouseCoopers report. "From refrigerators to parking spaces to houses, the IoT is bringing more and more things into the digital fold every day, which will likely make the IoT a multi-trillion-dollar industry in the near future." The evolution of the next generation mobile system will depend on the creativity of the users in designing new applications," continues Gubbi. "IoT is an ideal emerging technology to influence this domain by providing new evolving data and the required computational resources for creating revolutionary apps." Where energy resources are generally limited, whether to finances or availability, LED kits have managed to limit kerosene usage and save both energy supplies and money.

Data is the key for any business to stay and survive in the market. The more a business owner has data, the more it can connect with consumers. Latest IoT technology connecting various devices is planned in a way so that it can collect a great amount of data than ever before in order to provide accurate services to users. An IoT-ready business is able to track & record consumer-behavior patterns and then to form the next marketing / advertising strategy which proves to be effective to target demographics on a precise qualitative level. The buying-cycle will turn out to be shorter as consumers reach products via a research-based way—optimized / customized according to specific types of users. The search of the items will be possible even with a handful of spoken phrases and, consumers who find the exact match of products they are looking for. Yes, consumers will demand quick deliveries, but fortunately, several partners, such as suppliers and logistics service providers will also apply IoT-enabled practices to their work place. In result, orders will be processed faster.

Fig. 1. Online

B. Future of IoT

- Cybercriminals will continue to use IoT devices to facilitate DDoS attacks.
- More cities will become "smart".
- Artificial intelligence will continue to become a bigger thing.
- Routers will continue to become more secure and smarter.
- 5G Networks will continue to fuel IoT growth.
- Cars will get even smarter.
- Security and privacy concerns will drive legislation and regulatory activity.
- By 2025, it is estimated that there will be more than to 21 billion IoT devices

3. Conclusion

IoT is truly the next step in the information age. The Internet of Things could change our everyday lives, our everyday work, and our everyday communities. Think of the relief of not having to worry about what is in the refrigerator or if your stove is on while you are at work. IoT seeks to give your day back by bringing everything under your control to a single location. The technology will put your life at your fingertips as your smartphone becomes the main hub for the rest of your world. IoT is not just a simple idea, but, is already a major part of our lives.

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