

The Rise of the Internet of Things

Paul J. Mickey

Arkansas Tech University

Author Note

This is a final research paper for Technical Writing showcasing the use and rise of the Internet of Things devices.

Contents

Abstract 3

The Rise of the Internet of Things 4

Modern Use Cases 4

 Smart Homes..... 4

 Smart Businesses 5

 Healthcare 5

 Transportation 6

Conclusion 6

References..... 7

Figures: 8

Abstract

IoT devices are devices that one would not typically find connected to the internet but contain the ability to connect to the internet to allow control remotely. These devices can be controlled with one's mobile device, automatically by a computer, and/or home assistant. (Devices like an Amazon Echo or Google Home are two major home assistants.) Devices such as light bulbs, thermostats, microwaves, refrigerators, "smart" plugs, and many more devices are capable of being IoT devices. These devices can make one's everyday home life easier. For example, if one had IoT (or commonly known as "smart") lights, these lights could be programmed to automatically turn on once the person pulls into his/her driveway by using his/her phone's location or when the phone connects to the home Wi-Fi. Businesses can use this technology by being able to completely control and monitor a building's temperature and lights from a single office to save on energy costs. Even with privacy and security concerns, the general population will adapt to using IoT devices due to convenience. After the mass adoption is complete, people will not be able to imagine their lives without these IoT devices (like how consumers are to their cell phone), making them an essential part of any home or business. In general, the IoT device market will keep growing as long as consumers keep adopting it.

Keywords: Internet-Connected Devices, Home Appliances, business appliances

The Rise of the Internet of Things

The computer networking company Cisco stated in a whitepaper in 2011 that they predicted that the modern concept of Internet of Things (IoT) was “born” between 2008 and 2009 with them predicting by 2020 there will be 6.58 connected devices per person (in 2003 there was only 0.08 connected devices per person). (Evans, 2011, pp. 3) The timing seems appropriate considering Apple launched the game-changing iPhone in 2007. (Stein, 2017) This concept of internet connected devices isn’t new though, Carnegie Mellon’s Computer Science department modified a Coke vending machine back in 1982 so one could see if the machine had drinks and if they were cold from a computer terminal across the building so a trip down the hall was not wasted. (CMU CS, 2005)

Modern Use Cases

Like any piece of modern technology, there is more than one use case. Common uses are things like the smart home, smart businesses, healthcare, and transportation. The long-term cost and time savings are beneficial when using this technology. These use cases can also typically link into each other, so there is some overlap.

Smart Homes

The most common use of Internet of Things (IoT) devices are in Smart Homes and Smart Businesses. A common use case is that one could have the AC in their home turn down a few degrees the moment they leave the office by integrating the phone’s Global Positioning Chip (GPS) and a smart thermostat in order for that function to happen. The journal Twice wrote an article after the Consumer Electronics Show (CES) 2018 about how companies like Samsung and LG want everything to integrate seamlessly, so for example if one needed to turn off the lights in another room it could easily be done from the touchscreen on the refrigerator. (Wolf,

2018, pp. 43) There is also long-term cost savings because services like IFTT and the companies of these products are working together to automate processes like changing the AC, turning on/off the lights, arming/disarming a security system, and many more functions are out there.

Smart Businesses

Businesses can also use the same technology as the home to save on costs, but this transition could be costly. An article on Control Engineering put, “As companies grow, or seek to become wholly connected enterprises, system integrations can become costly.” (Marcy, 2018) In business in addition to the same uses as the home, there are other uses like data collection of machines and people. Businesses like Amazon can even automate the process of checking out at their new Amazon Go store, using one’s phone, sensors, and cameras allows customers to grab items, put them in a bag, and just walk out and then the computer will then do the rest. (Valdes, 2018, pp. 6) The Chartered Institute for IT talks about how in farming a drone can look for pests and another can automatically come by and spray pesticide on the pest eliminating the need for a farm hand to go out and do it. (BCS, 2017, pp. 13)

Healthcare

In healthcare, the term Internet of Medical Things (IoMT) is used for the equipment that is internet connected. This is helpful because a person could be wearing a fitness watch like a Fitbit and have data about one’s vitals and exercise sent to his/her doctor in real-time. This tech can also be used with the elderly so that if a person were to fall, they could have help come right away compared to having to wait for someone to come over and find he/her on the ground by using voice-controlled home assistant’s or things like Life Alert that is a button that the wearer has on their neck. Apple is even putting fall detection in their Apple Watch now, so help is just a push of a button away or it will notify loved ones automatically. (Dent, 2018)

Transportation

Transportation is the sector of IoT devices that is still in its infancy. Autonomous driving (the concept of letting a computer drive a vehicle instead of a person) will be one of the most beneficial technologies in this market when it hits mass production. There is the feature of driver assist that is rapidly coming to cars to supplement not being self-driving by instead being able to help the driver stay in the lane, monitor space and speed of the cars around, and being a more enhanced cruise control is the purpose of this technology. Another thing to look out for is companies launching smart vehicles that connect with the home and the road. One of the most impressive smart cars was when VW showed off their concept van at CES 2016 called the BUDD-e which is a modern spin on the old microbus that is all electric and is connected to one's smart home over the internet and had features like the mailman unlocking the van from his handheld to place a package inside the mail compartment in trunk of the car. (Lisota, 2016) Other uses for IoT in transportation is bus maps, traffic maps, traffic light ticking systems, and many more uses are possible.

Conclusion

This whole Internet of Things market is rapidly growing day by day. Figure 1 shows a visual representation on how devices are connecting together in one way or another. In 20 or so years one may not be able to imagine life without all these "smart" devices. The downsides are that there will be a constant struggle to protect against hackers and society may become too reliant on this technology that if all technology were to go away society may forget how to survive without it.

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Figures:

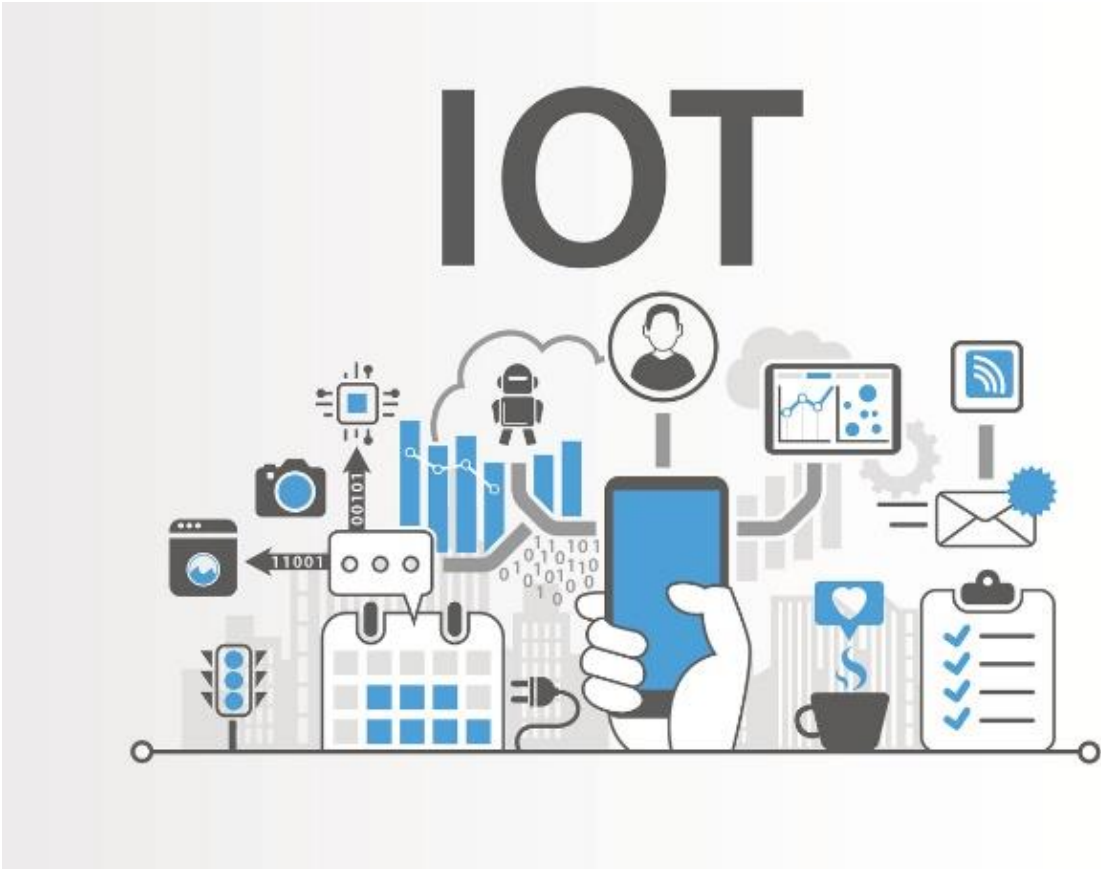


Figure 1. graphic showing how devices connect.

Source: Flexware Innovation