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**Abstract**

The label "Internet of Things" was first put forward by Kevin Ashton in 1999. Ashton had the vision to transform the world into a huge set of data. Analysis of this collected data would result in precise decision making. Accurate decision making subsequently increase efficiency and decrease wastage of resources. "Internet of Things" (IOT) is extensive connectivity of physical devices and objects from everyday life over the internet (Lee & Lee, 2015). Three components are considered three pillars of IoT (Lee & Lee, 2015). First, Electronic devices such as smartphones, smart televisions and autonomous cars. Second, Internet connectivity. Lastly, the sensors. How these three components interact to make the IoT works. What made the advancements in the field IoT possible is the combination of different technologies, real-time analytics, sensors, and embedded systems. For instance, the IoT scenario in a smart home can be described as smart devices such as television, a smart home stereo system, smart air purifier interconnected over the internet and controlled through smart devices. Understanding how these would work in coherence would clarify the IoT concept further. An owner of the house while leaving the house forgot to switch on the air purifier. While on his way to the office, the owner switches on the air purifier. IoT not only has impacted how the home operates, but it has modified how the way society works. In the years to come, IoT's impact on society will only increase for the good. Every innovation will be integrated within the society through IoT. Soon there will be smart cities working in tandem with other cities to facilitate the residents in the best way possible. In this paper, a brief history of IoT would be discussed. Furthermore, applications of IoT in the real world would be explained. The research methodology used specifically for this paper is theoretical research methodology. Lastly, the current trends related to IoT and future prospects would be discussed.

**Research Methodology**

In the field of computer science and information technology research can be carried out using three methods (Ayash, 2014). These methods are experimental methodology, simulation methodology and theoretical methodology (Ayash, 2014). Of these three methodologies, the theoretical methodology has been applied to complete this paper. Theoretical methodology for research requires theoretical and literature review of the work done so far in any particular field and reaching a logical conclusion (Ayash, 2014).

**Discussion**

**History of IoT**

Back in the year 1982, a smart soft drinks vending machine was developed at Carnegie Mellon University (Ornes, 2016). The machine was controlled over the internet (Ornes, 2016). Additionally, the machine was able to report back the temperature of the beverages was optimum or not (Ornes, 2016). At the time, it was considered a landmark innovation. Today it seems like an ordinary innovation with so many technological advancements making headlines every day. However, how small it might appear, that smart vending machine proved to a foundation stone in the domain of IoT. Now every aspect of life is influenced by the IoT in one way or the other. IoT applications have been widely used in society and change the lives of thousands of people.

**Applications of IoT**

Every aspect of society is influenced by IoT applications in one way or the other. These applications are categorized as a consumer, commercial, industrial and infrastructure applications.

**Consumer Applications**

A large chunk of IoT devices is targeted for consumer use (Manyika, 2015). Smart and semi-autonomous vehicles, smart home automated appliances, and smart wearable devices that make up the category of the Internet of Wearable Things are included in the consumer applications (Manyika, 2015). Smart home appliances are aimed at achieving wide-scale home automation (Stojkoska & Trivodaliev, 2017). Home automation appliances and applications range from automated lighting, heating, and cooling. Additionally, smart home security and monitoring systems also fall in the category of consumer applications (Stojkoska & Trivodaliev, 2017). The idea of a smart home revolves around a central device that controls and manages the rest of the appliances that are in the home (Stojkoska & Trivodaliev, 2017). The amazon's Alexa is a prime example of the central device that is used to control all the other devices. For instance, the temperature of an air conditioner can be easily decreased or increased using a voice command. Additionally, this preference will be stored by Alexa. Whenever the same voice of the person would be heard by Alexa, the temperature of the air conditioner would be set accordingly.

**Commercial Applications**

The IoT applications have revolutionized how commercial application previously worked. Be it medical and healthcare provision or efficient and sustainable transportation used for reducing the carbon footprint from the planet earth.

The field of the medical applications of the IoT is called the Internet of Medical Things (Joyia, 2017). These applications collect large amounts of health-related data for research purposes and monitoring (Joyia, 2017). This large amount of data has been employed to study and analyze symptoms of various illnesses and has helped to produce their vaccines (Joyia, 2017). Another useful application of IoT in health care is the production of widescale digitized health systems of healthcare (Joyia, 2017). These digital healthcare systems are connected together over the internet and different medical teams of different hospitals are connected to it simultaneously (Joyia, 2017). For instance, an individual that has been involved in a road accident needs to be administered treatment. The individual is unconscious and hence unable to communicate with the first responders. The first responders have two options. First, wait for the individual's doctor to assist the first responders with the patient's medical history. Second, using a smart portable device, which has digital healthcare application installed with connectivity with all the hospitals in town, retrieve patient's previous medical conditions to administer treatment accordingly. The second option seems more practical. This would not only save precious time but also the life of the patient.

As far as transportation is concerned, IoT has been employed to combine the intercommunication, command and control, and information processing of different transportation systems (Mohanty, Choppali & Kougianos, 2016). This system is also called an intelligent transportation system. The intelligent transportation system is aimed at efficient traffic management and empowering travelers with the latest information to make decisions for their travels accordingly (Mohanty, Choppali & Kougianos, 2016). Application of IoT in the transportation not only include the vehicles, but also the driver and the infrastructure upon which the vehicle is being moved (Mohanty, Choppali & Kougianos, 2016). Continuous connectivity and communication between the three parts of the transportation system can help significantly. It can help in controlling traffic smartly, efficient parking management, and digital toll collecting systems (Mohanty, Choppali & Kougianos, 2016). Additionally, control, safety, and roadside side assistance for heavy-duty vehicles can also be provided using IoT applications (Mohanty, Choppali & Kougianos, 2016). For instance, various electronic logging devices (ELD) have been created for heavy-duty vehicles. The ELD records all the necessary vehicular information and is sent to the employer of the vehicle. The employer can view whether or not the driver of the vehicle has been in compliance with the rules of breaks or not. Compliance with break rules is not only vital for the driver himself, but it is equally essential for the vehicles traveling over long distances.

**Industrial Applications**

The industrial applications of IoT are ample. The modern manufacturing devices are loaded with a number of sensors, through which these vehicles can identify, process and communicate over the network (Wollschlaeger, Sauter & Jasperneite, 2017). Network control and management of this manufacturing hardware mix the IoT with the industry (Wollschlaeger, Sauter & Jasperneite, 2017). Systems equipped with IoT are intelligent, that enable the production of newer items at a rapid pace and respond to rising product demand effectively (Wollschlaeger, Sauter & Jasperneite, 2017). Real-Time analysis can help achieve maximize outputs with optimization. Businesses are being revolutionized with each coming day with the help of IoT (Wollschlaeger, Sauter & Jasperneite, 2017). So much so, it is widely believed that by the year 2030, the world would have witnessed the fourth industrial revolution. The annual turn over after the fourth industrial revolution is estimated at $ 12 trillion of global GDP. For instance, a farmer equipped with the modern and intelligent tractor, sensors that can read various inputs such as temperature, rainfall, humidity, wind speed, pest infestation information is miles ahead from the farmers of the last decade. The sensors collect data and enable farmers to take decisions in order to improve the quality of produce, minimize wastage, and decrease the rigmaroles of sowing the seeds. Additionally, sensors that continuously monitoring the soil, enable farmers to take decisive measures even from remote locations.

**Infrastructure Applications**

The IoT integrate infrastructure is aimed at constantly monitoring for changes in structural conditions jeopardizing the safety of the people (Sotres, 2017). The infrastructure that can be monitored in a sustainable urban city includes bridges, railway tracks, and much more (Sotres, 2017). The construction industry can reap the benefits of IoT by saving huge costs, reducing time, and enhanced productivity (Sotres, 2017). Additionally, real-time data analysis can empower authorities to take timely decisions based on evidence instead of opinions (Sotres, 2017). Task coordination between different service providers could be used for scheduling a repair and carrying out maintenance activity in a coordinated manner in order to minimize the difficulties of the users of the infrastructure can be done through IoT (Sotres, 2017). At a metropolitan scale, the deployment of IoT can yield remarkable results. For instance, in South Korea, a city is being built that would be equipped with all the modern hardware that would be interconnected. This city has been named Songdo, which envisions little human intervention when it comes to public service provision. With the debilitating global climate, various sensors have been developed that assist in protecting the environment. These sensors constantly monitor several indicators such as air, water, atmosphere and soil conditions.

**Conclusion**

One of the most important outcomes of the IoT is considered to be the exponential growth of the smart devices that controlled through the internet. IoT has provided an opportunity to visualize the physical world in the computer-based systems. As a result, efficiency has been improved, economic benefits have been increased manifold, and human exertions has been decreased. To understand the economic effect of IoT, it is vital to grasp the total market value of the IoT market in years to come. By next year, the global economy will see an addition of almost $ 7 trillion. Therefore, the production of smart devices is going to increase significantly. The number of smart devices connected via IoT in 2017 was 8.4 billion. It was an increase of 31 pc from the previous year. According to an estimate, by the year 2020, there would be 30 billion smart devices connected through each other in one way or the other. In the future, IoT will be coupled with artificial intelligence. This is an indication of the pace and accuracy with which the estimated 30 billion devices would employ. The benefits of IoT are great. However, what is debatable are the challenges relating to IoT. The challenge of security remains the biggest hurdle in the field of IoT. With the increase in the production of smart devices that provide great opportunities, commercial and user space may experience turbulence. Sensors that are employed to store tonnes of information continuously, in some cases, can also store sensitive data. With recent global events suggesting that security of the information can be jeopardized at any moment. The incidents of data breaches at google and facebook has cast a shadow over the security of the information being collected under the IoT. With Cambridge Analytica, a company that was highly regarded when it came to handling large quantities of data, was found to indulge in the sale of personal information of many consumers in order to manipulate elections. One could only hope for the best given the terrible security situation regarding the safety and privacy of sensitive information while employing smart devices and the internet to their best use.

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