IOT AND ITS APPLICATIONS

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ABSTRACT

With the Internet becoming more widely available and the cost of connecting dwindling day by day, more and more devices are integrated with Wi-Fi enabled technologies and sensors are flooding the market. As a result, such technologies are becoming much more affordable to the common man and have taken mankind by storm. The term Internet of Things (IoT) describes several technologies and research disciplines that enable the Internet to reach out into the real world of physical objects. This paper discusses about Iot and its implications to man.

KEYWORDS: *Internet- Integrated- Devices- IOT- Applications*

INTRODUCTION

The Internet of things (IoT) is the network of physical devices such as smart phones, vehicles, home appliances and other items that have within them or rather embedded with electronic circuits, software, sensors, actuators, and network connectivity which enables them to connect and exchange data. Each of these objects is unique in their computing system that is embedded within and therefore identifiable. But, they possess the ability to inter-operate within the existing internet infrastructure.Experts project that the number of objects that IoT will consist of will be about 30 billion by 2020with its global market value reaching $7.1 trillion. The IoT technology allows the sensing and remote controlling of the objects through an existing network thereby paving way for integration of the physical world into computer-based systems, thus resulting in improved efficiency, accuracy and benefit economically with reduced human effort and intervention.

The term "the Internet of things" was coined by Kevin Ashton of Procter & Gamble, later MIT's Auto-ID Center, in 1999. The IoT represents the most potentially disruptive technological revolution of our lifetime.We are now experiencing a paradigm shift in which everyday objects become interconnected and smart.It encompasses technologies such as smart grids, virtual power plants, smart homes, intelligent transportation and smart cities.

Applications

IoT finds applications in nearly every field. The applications for internet connected devices are extensive. However, its application s are broadly classified and given below.

- **Consumer applications:** A majority of IoT devices created is aimed for consumer use. A few examples of consumer goods which employ Iot are cars with GPS and other facilities, home appliances which are also known as smart home devices, and other appliances such as washers, dryers, vacuum cleaners, air purifiers, ovens, refrigerators and freezers that use Wi-Fi for remote monitoring. Most consumers feel the integration of it with daily use appliance provides a much satisfying user experience and easier handling with better features.

- **Home Automation:** IoT devices form a major part of the concept of home automation, also known as domotics.A main hub or controller is provided which acts as the central control of all the devices. It also includes lighting, air conditioning, media and sound systems and security systems. Iot claims to be environment friendly in the aspect that it can facilitate switching off lights and other electrical appliances when not in use from remote sources. However, it does not emerge to be a cost efficient option.

- Another key application of Iot enabled devices is their use in **assisting physically challenged and old aged individuals**. User specific modifications can be done to the systems to suit the needs of the user. Voice control can be enabled for people with vision problems and for those whose level of mobility is limited. Alteration in the circuiting can be done such that the alert system is connected directly to the cochlear implants of people who have deficient hearing.

- **Infrastructural Management:** Iot helps in the monitoring and controlling operations of infrastructures like bridges, railway tracks, on- and offshore- wind-farms, oil rigs etc. The main purpose of its integration in infrastructure is for monitoring changes in the structural conditions that compromises safety and increases risk. It is also being employed used for scheduling repair and maintenance activities.

- **Agriculture:** The IoT has contributed significantly towards innovation in farming methods. In fact, agriculture is one of the first industries to utilize the IoT and reap the benefits. The integration of wireless sensors with agricultural mobile apps helps the farmers in collecting vital information pertaining to the environmental conditions such as temperature, rainfall, humidity, wind speed, pest infestation, soil humus content or nutrients. Certain app-based farming methods also facilitate crop monitoring also which lowers the hassles of managing crops at multiple locations. But the main disadvantage is the lack of awareness among farmers regarding these findings. User friendly technologies which can be operated in vernacular languages may prove to be fruitful.

- **Energy Management:** As mentioned earlier, Iot is very helpful in managing energy systems and hence is environment friendly. In an era where power is of utmost importance for sustenance, it helps to optimize power consumption. Research is being carried on at various levels to integrate Iot in the form of chips or circuits into electrical appliances such that the user can remotely control them or manage via a cloud-based interface. This system helps to check power usage. The user can also schedule the devices and control conditions such as lights, temperature in air- conditioners etc.

- **Environmental Protection:** Iot aids in protecting the environment by monitoring air quality, soil quality, atmospheric conditions etc. this helps us to keep a track of the pollution levels within a particular area and document the data. Analysis of the documented data will provide results on the pollution level within the area which will be used by the policy makers to formulate polices concerning methods to curb pollution.

- **Disaster Mitigation:** Its high degree of motility and ability to span a wide geographical area helps Iot along with specific devices greatly in the area of disaster warning systems and its mitigation. Development of application for the early detection and warning of earthquakes and tsunamis can save a great deal of lives and properties.

- **Medicine:**Iot enables monitoring and notification in cases of emergency situations of the patient. Remote monitoring of health parameters such as blood pressure, sugar levels, heart rate etc. can be performed. Advanced implants such as pacemakers, higher end versions of hearing implants can also be monitored using the network infrastructure available at the hospitals and also in the homes of patients. This is also a convenient method for doctors to monitor their patients remotely and incase of discrepancies the patient may be asked to call on the doctor. Iot builds a platform for higher end patient monitoring and encourages healthy living.

- **Transportation:**The field of transportation and logistics is also undergoing mass transformation and revolution with the introduction of Iot. It is used to integrate, monitor and communicate data and information. It has touched almost all aspects of transportation such as the vehicle, the systems contained within it and the user. User friendly cars integrated with technologies and systems for better driving experience and navigation have flooded the markets and area hit among the consumers. Iot can also be employed to monitor vehicular traffic, speed, traffic control and drills, smart parking facilities that are available in public places like malls, automated toll collection and road safety management.

CONCLUSIONS

The impact of Iot in our day to day lives is unimaginable. It has indeed altered our way of living. It is a time and effort saving alternative to manpower. Its applications are found in almost all fields that are in a constant phase of updating and development. Embracing Iot with open arms could be advantageous to mankind owing to its wide range of applications and also other facilities such as storage and transfer of data for remote communication, tracking of systems for quality assessment and budget friendly by replacing humans for monitoring and maintenance.

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