Study on Internet of Things

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KEYWORD

IOT; Internet of Things; RFID; Devices; Mobile

ABSTRACT

More than 9 billion 'Things' (physical objects) are presently connected to the Internet, as of now. In the future, this number is predictable to rise to a enormous more than 20 billion. The Internet of Things (IoT) is the interconnected of physical devices that comprise electronics embedded within their architecture in order to communicate and sense interactions amongst each other or with respect to the external environment. In the upcoming years, IoT-based technology will offer advanced levels of services and practically change the way people lead their daily lives.

1. Introduction

The Internet of Things (IoT) is the networking of physical items with electronics built in their design that allow them to communicate and feel interactions with one another and with the outside world. IoT-based technology will deliver advanced levels of services in the next years, effectively changing how people live their lives. Medicine, electricity, gene treatments, agriculture, smart cities, and smart homes are just a few of the categories where IoT is well-established.

Currently, over 9 billion 'Things' (physical items) are connected to the Internet. This figure is anticipated to reach 20 billion in the not-too-distant future.

1.1. Components used in IoT

Low-power embedded systems –

The inverse characteristics of low battery consumption and high performance play a vital influence in the design of electronic systems. IoT Features Overview (2021).

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Cloud computing –

IoT devices collect a massive quantity of data, which must be kept on a trustworthy storage server. In this case, cloud computing comes in handy. The data is examined and learned, giving us greater flexibility in locating electrical faults/errors in the system.

Availability of big data –

We all know how important sensors are in IoT, especially real-time sensors. As these electronic gadgets become more prevalent in many fields, their use will result in a large influx of big data.

Networking connection –

In a world where each physical object is represented by an IP address, internet connectivity is required to communicate. According to IP naming, however, there are only a limited number of addresses accessible. This naming method will become obsolete as the number of devices increases. As a result, scientists are seeking for a new naming system to describe each physical thing.

IoT will become broader and more complex in terms of scope. It will change the world in terms of "anytime, any place, anything in connectivity."

1.2. IoT Enablers

RFIDs: uses radio waves in order to electronically track the tags attached to each physical object.

Sensors: devices that are able to detect changes in an environment (ex: motion detectors).

Nanotechnology: as the name suggests, these are extremely small devices with dimensions usually less than a hundred nanometres.

Smart networks: (ex: mesh topology).

1.3. Characteristics of IoT

- Massively scalable and efficient
- IP-based addressing will no longer be suitable in the upcoming future.
- Devices typically consume less power. When not in use, they should be automatically programmed to sleep.
- A device that is connected to another device right now may not be connected in another instant of time.

- Irregular connectivity – The Internet of Things (IoT) isn't constantly connected. When devices are not in use, they will be turned off periodically to preserve bandwidth and battery life. Otherwise, connections may become unstable, resulting in inefficiency (Internet of Things Characteristics (2021)).
- As a quick note, IoT incorporates trillions of sensors, billions of smart systems, and millions of applications.

1.4. Application Domains

IoT is currently found in four different popular domains:

- Manufacturing/Industrial business - 40.2%
- Healthcare - 30.3%
- Retail - 8.3%
- Security - 7.7%

1.5. Modern Application of IOT

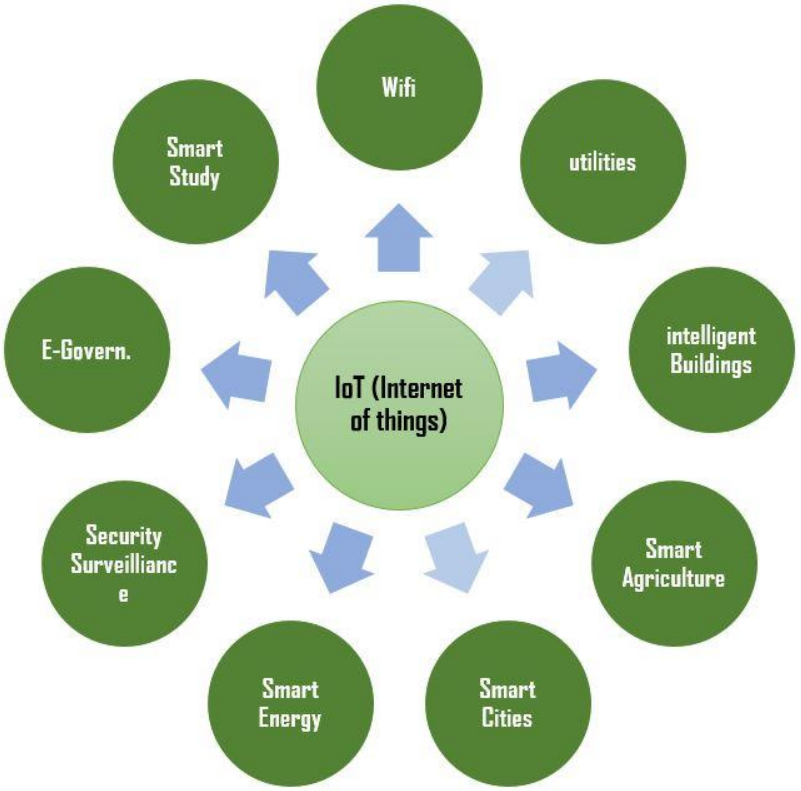

Figure 1: Applications of IOT

Modern Application of IOT

- Smart Grids
- Smart cities
- Smart homes
- Healthcare
- Earthquake detection
- Radiation detection/hazardous gas detection

2. Conclusion

Currently, more than 9 billion 'Things' (physical items) are connected to the Internet. This figure is expected to increase to more than 20 billion in the future. The Internet of Things (IoT) is a network of physical items that are linked together by electronics inherent in their architecture, allowing them to communicate and perceive interactions with one another and with the outside world. In the future years, IoT-based technology will provide advanced levels of services and will fundamentally alter people's daily lives.

3. References

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Overview of IoT Features, (2021), https://www.educba.com/iot-features/