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Applications and Models of IoT : A Survey

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***Abstract* – IoT (Internet of Things) has become the trending technology as it is progressively growing to make people's living smarter and easier. IoT is defined as "The physical things are embedded with sensors to exchange data with other devices over internet." These sensors collect the data of the surrounding environment and that data is transfer to other devices through microcontrollers, so that devices get connected with each other to perform required tasks without human intervention. This technology has been used in various domains like healthcare, industrial, agriculture, etc. IoT is now being enhanced as some other technologies like machine learning, cloud computing, ubiquitous computing are being used along with IoT. It has advantages and disadvantages as well. Benefits of IoT are speedy operation, ease of access, minimizes the human effort. On the other hand, it has security problems as hackers can access the personal data over the internet, people depend on IoT systems, making them reluctant. Inspite of these problems, IoT is making people's life better and it smoothens the operations in domains such as business, healthcare, Agriculture etc. Objective of this paper is to understand IoT along with its applications, advantages and challenges, based on the survey.**

Keywords - IoT, Smarter, Sensors, data , Speedy operation, Security , Various domains

I. INTRODUCTION

Internet of Things can be described as a network of inter-related devices such as computers, sensors and digital machines which have the ability to transfer data over network without much human intervention. [1] Traditional fields such as wireless sensor networks, control systems collectively forms the Internet of Things. [4]IoT devices have a unique UID number which help identify the device over network & transmit. IoT applications are used in different fields. Depending on the area of application and user we can categorize IoT into 3 types:-

1)Consumer IoT – [2]This part forms a part of IoT application that are used for consumer usage like smart watch, home automation, health appliances.

2)Industrial IoT – It is also called as Industrial Internet of Things(IIoT). It helps in monitoring & regulating industrial system. Industrial IoT have applications in fields like manufacturing, agriculture, maritime, etc. IoT devices can also be used in monitoring incident management and infrastructure development fields.

3)Military IoT – It is also known as Internet of Military Things. IoT is used in military for reconnaissance, surveillance, etc. Military uses IoT for making communication and tracking activities on war field safely and privately.

IoT gives the ability to the companies, users to automate the process. [3]Use of IoT makes things work faster, more efficiently and reduces the cost of process. Hacking into system, stealing of data are the privacy concern, and risks of IoT. As the requirement increases the count of iot devices increases , handling them can be a bit difficult for the company. With increasing industry requirements, the productivity will rise and will create an incredible market. IoT have a promising future.[7]

II. LITERATURE SURVEY

The author [1] has offered a detailed overview from both a technological and a social standpoint in this essay. The paper goes through many IoT challenges and issues, as well as architecture and key application domains. In addition, the paper focuses on existing literature and shows how it contributes to many elements of IoT. Furthermore, the significance of big data and its analysis in relation to IoT was emphasised.

The author of this post surveyed numerous concerns and challenges that IoT developers must address in order to design a better model. Also highlighted are significant IoT application areas in which IoT developers and researchers are involved. IoT creates a large amount of data while offering services. As a result, the significance of big data analytics is explored, which can provide precise conclusions that can be used to design a better IoT system.

In this paper the author [4] is trying to explore and explain various fields for application of IoT. The author is also trying to put some light on various challenges faced with applications of IoT. IoT have applications in various areas such as healthcare, smart home, etc. IoT is now regarded as an important part in evolution of Internet. In development of smart cities and their general infrastructure IoT is

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playing the role of a catalyst. [4]Area of application of IoT in smart cities are intelligent transportation systems , smart building, traffic congestion waste management , smart lighting, smart parking, and urban maps. IoT applications in health care sector can help to make processes fast and more efficient. Advantages of IoT [4] application in the health care sector is most categorized into tracking of patients, staff, and objects, identifying, as well as authenticating, individuals, and the automatic gathering of data and sensing. IoT modules such as RFID tags, Bluetooth, Wi-Fi will help[4] enhance the measurement and monitoring techniques of function like blood pressure, temperature, heart rate, etc. IoT in Supply Chain and retail Management gives benefits like [4]observing storage conditions throughout the supply chain, product tracking to enable trace ability purposes, payment processing depending on the location or activity period. To provide good and healthy environment , IoT can be used integral part of Smart Environment system. IoT technology is also used in [4]measuring pollution levels in water and consequently enlighten decisions on water usage. IoT concept uses technologies such as heterogeneous which are used in tasks like [4]sensing, collecting, action, processing, transmitting, notifying, managing, and storing of data, due to which challenges are bound to arise. IoT uses WSN technology which have its own short comings such as security issuses. Attacks tries to exploit the weakpoint in devices and try to gain access into systems.[4] Also there is a concern for cloud architectures that would not be effective in terms of transferring large volumes of data created due to IoT enabled devices and support the computational load by meeting timing constraints. Use of technology such as ML methods , AI algorithms can be used in such problems. Also [4]IoT systems are being designed to manage higher degrees of interoperability. From the above discussed paper we can conclude that IoT applications can make our day-to day life more easier and handling the challenges can help recover the short comings.

In paper [7], Authors have explained the technological challenges of IoT, social issues due to IoT and reviewed business aspect as well. The technological challenges observed by authors are security, privacy, connectivity, compatibility, Complexity, Data Management, Data Flow, Limited Energy Resource. Authors also study reviews for business aspect and it came to know that on one side, to increase the success rate of IoT products, employees need to know tools and methods and utilize them in a efficient and secure manner. On the other side, business is also growing by understanting how IoT can bring value.

Social limitations affecting the growth of IoT industry like spreading of social myths like wind, social perceptions based on hearsay, regulations and laws of the land, exposure to the usage of technology, technological resources available, consumer confidence. At the end authors have demonstrated that how technological improvement, business growth and social aspect are related to each other. As society make opinion about IoT products and that feedback affect business growth and accordingly, it encourages engineers to do better in this technology.

III. LITERATURE SURVEY TABLE

Sr no.	Proposed System	Achieved Parameters/Protocols	Advantage	Disadvantage
1.	Importance of big data analytics in IoT.	Challenges of IOT developers.	1.This paper gives the overall survey of IOT domain and its applications.	_
2.	Reference model of IOT gateway	Zigbee ,Bluetooth	1.This model transfer data from one network interface to another interface transparently and correctly.	_
3.	Current security flaws in commercial IoT systems, as well as the need of security being considered as an inherent aspect of IoT.	Zigbee, BLE implementation	-	1. In the literature, further security enhancements to current standards have been proposed, but they have yet to be adopted by standardisation bodies or implemented in commercial products.
4.	Applications and Future of IoT	Wide range of applications for IoT and handling challenges	1.This paper gives information about various application fields of IoT. 2.It also focuses on finding solutions to research challenges.	_
5.	Cloud system used for sharing user IoT devices	Sharing information using Cloud & IoT	1.This paper focuses on building an IoT centric device network based on a Cloud computing model.	_
6.	Economic Losses caused due to Cyber risk in IoT.	Identifying cyber risks arising due to IoT some applications.	1.Factors in IoT that increases cyber risk on the user.	_
7.	Presented Technolgical challenges,Business Review,	Various drawbacks of IoT from different point of	1.Reveals the other side of Iot so that technicians can work	Solution to overcome technological and social

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	Social issues.	view.	on it to overcome those challenges and enhance IoT	issues is not provided.
8.	Presents a survey, examination and assurance challenges in IoT with logical arrangement of security	Security and privacy threats in IoT along with priciple of Cyber Security	1.Identifies threat and security issues in IoT to provide effective solution	_
9.	Application of IoT in agricuture, healthcare,natural calamities, smart homes	New,innovative and effective application of IoT	1.Showcased various applications of Iot	Concepts of application are explained on a surface level.
10.	Smart Farming using IoT to operate high-voltage electrical components such as pumps and playhouse flaps.	ThingSpeak Cloud, wi-fi, some IoT applications, Sensors.	This paper gives values of IOT application using cloud and IOT sensors.	_

IV. CONCLUSION

We did survey on the concept of IoT and its applications along with is it's advantages and disadvantages. Based on the survey, we have presented two sides of IoT technology. IoT is making the world smart and connected; on the other hand, there are some security and privacy related challenges which needs to be solved efficiently.

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