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A Survey: Internet of Things (IOT) Technologies, Applications

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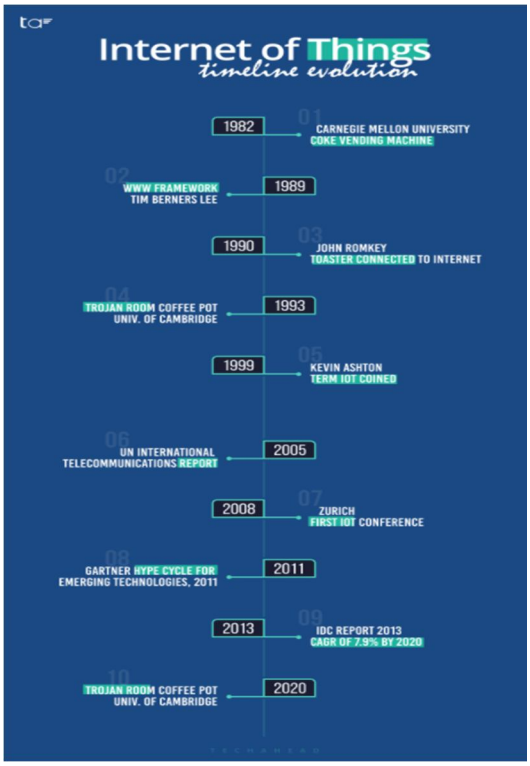
Abstract: ***Internet of Things is influencing enormously in our lifestyle from the day we begin to the day we end. IOT is an immense network with connected devices. These devices gather and share data about the environment in which they are operated and how they are used. Internet of things is a very intense concept in which the real world of things is connected to implicit world of information technology. The paper tell about the internet of things such as home auto machines, sensors makes our life more comfortable. Analytics is performed on the data from the IoT therefore the valuable information is extracted as per requirement and visualization to generate actionable intelligence and create value.***
Keywords: IoT.

I. HISTORY

In the early stage of 1982, there was discussed about the concept of a network of smart devices at Carnegie Mellon University on the modified Coca-Cola vending machine. And it became the first ARPENT-Connected Contraption, that can report its inventory and whether newly loaded drinks were cold or not. In 1991 "The Computer of the 21st century", which was the paper of Mark Weiser on Ubiquitous Computing, as well as Ubicomp. In 1994, Reza Raj described the concept of the IEEE spectrum. And several Companies proposed solution like Microsoft's at work or Novell's NEST between 1993 and 1997. In the year 1999, the world Economic forum at Davos, Bill Joy visualized the device-to-device communication as a part of his "SIX WEBS" framework. The field of IoT gained more momentum after he envisioned. The concept of the "Internet of Things" and the item itself first appeared in the speech by Peter. T. Lewis that published in September 1985. According to Lewis, IoT is the integration of people, technology with connectable devices and sensors to enable remote monitoring, manipulation, and evaluation of trends of such devices.



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II. INTRODUCTION

Internet of Things is influencing enormously in our lifestyle from the day we begin to the day we end. IOT is an immense network with connected devices. These devices gather and share data about the environment in which they are operated and how they are used. The preeminent concept is, The Internet of Things describes the network of physical objects, so know as, "THINGS", it's all done using sensors, and sensors are embedded in every physical device. In recent times, it is getting more attention due to its advancement of wireless technology. IOT transforms these objects from being conventional to smart by manipulating its underlying technologies such as embedded devices, wireless sensor networks, automation protocols, and applications.

For example, it can be Mobile phones, electrical appliances, bar code sensors, traffic lights, etc. There are so many contraptions in almost everything that we come across in our day-to-day life. The sensors that are used in the devices emit data continuously, about the working state of the particular devices. By this, the life of potential users can become dead-easy and comfortable by adopting various technologies based on IoT.

In this, the IoT has a dramatic effect on the domestic sphere such as smart homes, smart cars, etc. In the business field, it has made a noticeable advancement in the manufacturing and service industry to give better services for the consumers and also to increase production and superior quality.

The adoption of the above technologies worldwide may look smooth but it involves lots of issues so that it needed to be solved before worldwide acceptance. The major issue is that IoT is off security cause of cyber hackers and some other. Therefore in order to resolve these complicated issues research are needed.

A. Need For IoT

- IoT needs for devices to interact and collaborate to share experiences just like the human tube.
- IoT is a platform every day so that, devices are connected to the internet, so they can interact and exchange data with each other.

But the important question is how do they put the data to our benefit, IoT provides a common platform for all these devices to dump their data. And a common language for all the devices to communicate with each other data is emitted by various sensors.

B. What is IoT?

The term "Internet of Things" was credited by Kevin Ashton of Procter and Gamble, later MIT's Auto-ID Center, in 1999.

IoT has two keywords Internet and Things, Internet is a network of networks, it is interrelated, inter-connects of computing devices. It is a medium of which devices are connected and things or any objects with intelligence connected to the things and that are provided with unique identifiers and without requiring human-to-human or human-to-computer interaction they have ability to transfer data over a network.

III. APPLICATIONS

IoT applications are used in various ways and it helps businesses simplify and improve the automation and the processes while providing the relevant information and it helps in the activity processes of automation. IoT applications also help to drive new business which is needed to develop products and services.

There are many applications for IoT devices they are often divided into

- Consumer
- Industrial
- Organization
- Infrastructure spaces

A. Consumer

For consumer use, the growing portion of IoT is created it includes, home automation, wearable technology, appliances with remote monitoring capabilities.

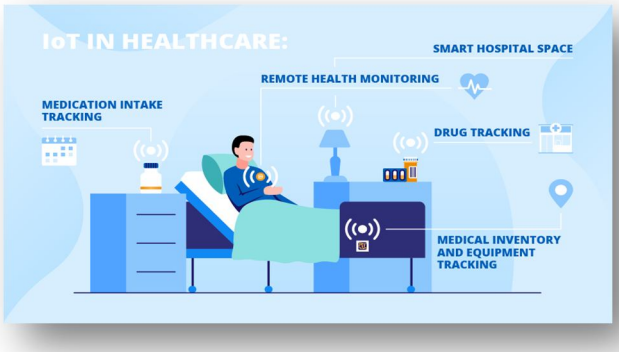
- *Smart Home:* IoT devices are a part of a huge concept called "Home Automation", in which every moment of the home like lighting, heating, switch ON of a fan or Ac, there are various types that come under home automation, it helps in energy saving by automatically ensure the light and electronics are turned off if there are no residents in the home.

For example, nowadays the company called Tesla released a self-driving car that is purely based on the AI of IoT.

Tesla designed cars that come standard with advanced hardware, capable of providing Autopilot feature and it is completely based on self-driving which is designed to improve functionality over time.

B. Organizational

- *Health care and Medical:* IoT is an application for medical and health-related purposes, it has major issues on research, devices, data collection, therefore IoT has answers for all these problems and it is also referenced as "Smart Health Care", as the technology for creating a digitalized health care system connecting with available medical resources and health services.



Internet of things emphasizes the health care profession and improves the quality of care finally, it reduces the sustaining of medical devices.

- *Transportation:* IoT has its contribution in transportation, IoT can assist in the integration of communication, control, and information processing across various transportation systems. IoT extends in all field of transportation, like smart parking of vehicles, smart traffic, electronic toll collection, vehicle control in emergency time, and road assistance.

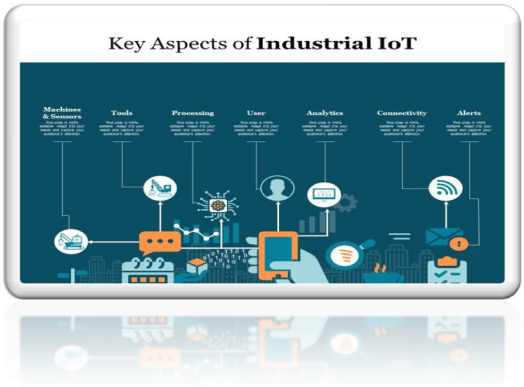
C. Industrial

At present IoT, are used in industrial automation because of problems faced due to manual practices in the industries inconsistency in data entry, time consumption in production, and reporting of labor and staff training cost and lack of security IoT is the best solution to reduce the optimization and time saving and quality controls and industry management. It secures security and monitor, industrial system. Also, the same enactment can be carried in industrial storage to keep automated record update of asset placement.

- *Agriculture:* There are many types of IoT sensors for agriculture as well as IoT has numerous applications in farming that help a farmer to produce a better productivity of crops here IoT collects data of climate, humidity, pest infestation, and soil content and it is used to automate farming techniques for crop management, by this farmer can improve quantity and quality, and there will be minimization of risk and waste and reduce the effort required to crop management.

The main goal of IoT in agriculture is, the data of his or her farm is coupled with IoT which increases productivity and helps in reduces the costs.

The most important thing in IoT there is the application of Machine Learning and AI.



IoT has contributed to developing country's where they are facing the problems like high population density, poor evacuative in structure, exposure to weather conditions like temperature humidity, therefore IoT gives the solution by production, response, and recovery.

IV. ADVANTAGES

Integration of things facilities varies advantages in day-to-day life. And also, in the business sector.

1) It reduces the effort of humans.
2) It increases the productivity of crops in agriculture.
3) It gives more business opportunities.
4) There is more work safety it gives many numbers of business opportunity.
5) It has well organized towards resource utilization.
6) There is a systematic and well-planned operative management

V. DRAWBACK

As the internet of things facilities a set of benefits it, also creates a significant set of challenges.

1) Security:- Here the IoT system are interconnected and communicate over networks. Therefore it can lead to various kinds of network attacks as they evolve and expand in use.

2) Technical complexity:- In the system of IOT enabling the huge technology maintenance, designing and developing is bitt Complicated

3) Connectivity and power dependence

4) Time-consuming and expensive to implement.

VI. CONCLUSION

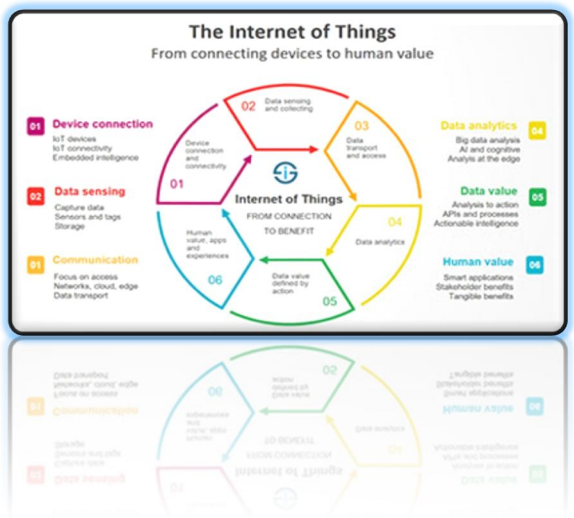
Internet of things is a very intense concept in which the real world of things is connected to implicit world of information technology. The technology of the internet of things such as home auto machines, sensors makes our life more comfortable.

Analytics is performed on the data from the IoT therefore the valuable information is extracted as per requirement and visualization to generate actionable intelligence and create value. Finally, the result is shared with other devices for better user experience automation and improving the efficiency of the devices.

IoT applications promises to bring immense value to number of openings for IoT professionals at an all-time high. I think it is the best time to begin the exposure through potential at this technology.

VII. FUTURE SCOPE

In this one year internet-connected device is from 5 million to billion. Where still some of the areas are needed the work of IoT so the devices forming the base of IoT. It is wireless in nature and resides at very remote places with great functionality of each device we need algorithms and hardware that are having efficient energy to avoid quick draining of battery's therefore we need to make sure sensors are active for a longer duration.



Other than this the advanced technology is security, it is also a standard-issue that will keep getting bigger with more and more devices being connected. So in future days to solve this issue we have to do intense research on IoT.

In the future of IoT it has limitless potential advancement to the industrial internet through an increase in the network ability and the scope of AI it will going to make intense.

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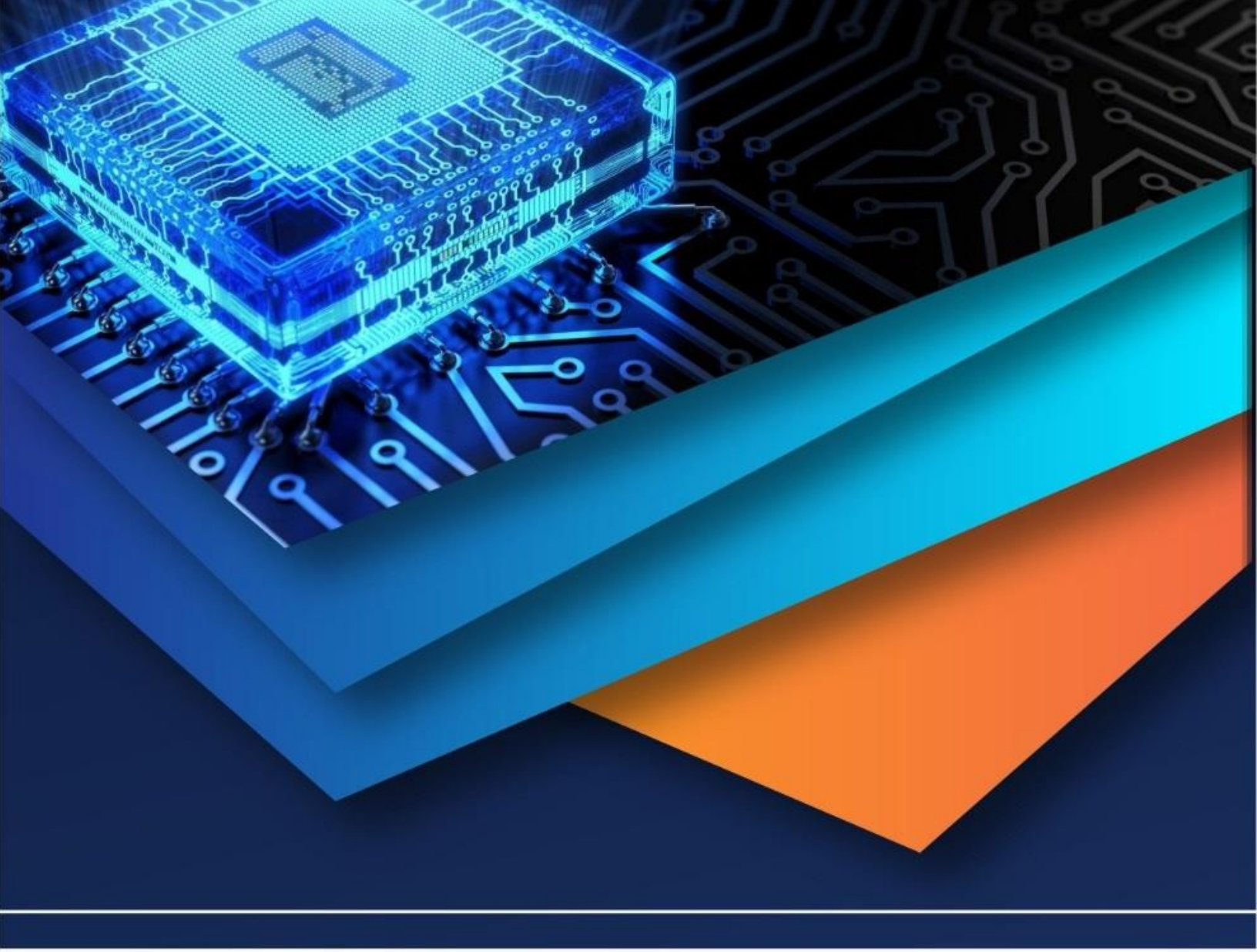

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