IOT Applications and its social cause

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***Abstract* –** With the emergence of internet technologies lots of devices are connect with the IOT.IOT devices are communicated over the network. each and every thing are connected with internet and coordinating with each other through some communication network. The Smartness and mobility are two important parts in IOT. In iot the wireless media are used for connection purposes such as Wi-Fi, zig-bee, 3G, 4G are used. The IOT is the future of the internet and there are many application is include such as smart city, smart home and buildings, smart transportation, smart energy and smart grid, smart agriculture, smart water, smart healthcare, smart environment etc. This Application work smartly through the internet each and every object give smartness through IOT. This Paper proposing the idea of combining various technologies with IOT and its benefit for various areas.

***Keywords*-IOT,IOT application, IOT Challenges, IOT future technologies.**

I. INTRODUCTION

The IOT is refers to communication and interconnection of an electronic devices such as laptops,computers, smartphone,mobile phone,tablets ,sensors and actuators and many more digital devices through the internet for sensing,communication and identification purposes. iot is becoming a machine-to-machine interaction. The IOT devices can see, think, hear and act as they talk to each others through this sensors used in IOT this environment will become a pervasive. This iot devices are available to any time and any where eg. when we want to enter into the room the fan and lights are automatically start through that IOT sensors its will happens easily. In fig1 says that with the internet of things, anythings can able to communicate to any where with the help of internet at any time by any place to provide any services through internet by any networks. In iot applications I Specially focused iot applications in agriculture. because my future project based on iot in agriculture. IOT is the internet for humans. We replace the humans with the things then that's make the internet of things. things means that are embedded with the devices, software and hardware and that all devices are connected through the internet that's called the meaning of word IOT(Internet Of things) e.g. smart phones, Air conditioner, smart washing machine, automated vehicles etc. That all devices are connected with internet and they can share the data they can communicate with each other with using some common language.
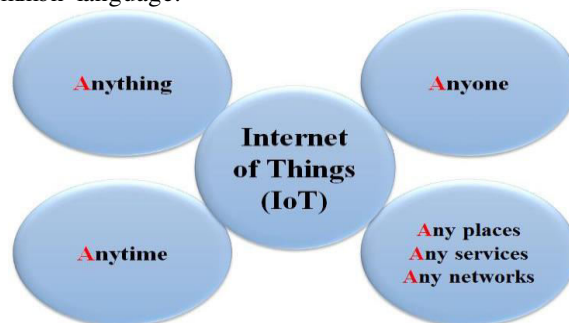

Fig. 1. Internet of Things Concept

II. LITERATURE SURVEY

In [3] N. Sathiyanathan, Selvakumar. S, P. Selvaprasanth analyze and statistically categorize and analyze current research approaches on IoT application approaches published between 2011 and 2018. According to the content of the current study selected, this study will use SLR processes that include general aspects of healthcare, environmental monitoring, smart cities, commercial and industrial testing, and IoT applications.

In [1] Zeinab Kamal Aldein Mohammed, Elmustafa Sayed Ali Ahmed review a concept of many IoT applications and future possibilities for new related technologies in addition to the challenges that facing the implementation of the IoT.

In[2] Abdur Razzaq, Riaz Ahmed Shaikh, M. Ali Qureshi, Mirza Adnan Baig, 3Sajid Habib Gill different emerging IoT applications are discussed to improve understanding of IoT use, facilitate researchers' community about IoT services to serve the humanity.

In[4] R.Sindhuja and B.Krithiga A key in soil testing for formulated fertilization is to determine the amount of soil nutrients, followed by recommendation of the nutrient needs and site specific fertilization. Nitrogen, Phosphorus and Potassium are the three important nutrients required for the

plant growth. In the present work electrochemical sensor has been developed to determine the N, P, K and other types of nutrients present in the soil. The electrochemical sensor is based on the principle of absorption of ions from the aqueous solution of soil. Here the sensor along with the Arduino Microcontroller circuits is built to detect the deficient component of the soil.

In [5] M tirupathi Reddy, R Krishna Mohan it is discussed that the application of IoT in various fields such as home automation,transportation,energymanagement, manufacturing, medical etc.

In [6] Yusuf Perwej, Kashiful haq,Firoj Perwej,

Mumdouh M.Mohamed Hassan In this paper, we are briefly discussing about the Internet of Things and applications in several fields. The IoT applications are using at the edge of the network sensors accumulate data on a computing and communicating device and actuators to perform distinguished tasks controlled by these devices.

In [10] SushmaReshmi,Prof.Vivekanandreddy Consequently by using technology the fertility of soil can be verified using various sensors. Temperature/humidity sensor, pH sensor, and NPK sensor are used. Sensed data is sent to server and stored on database, then information is sent to farmers mobile with soil nutrients present and type of crop they can grow to gain better yield. This makes the soil testing procedure easy. Method used to detect soil nutrient is colorimetry.

III. IOT APPLICATIONS

The application of IOT are important in every field for everyone and everywhere.The application of IOT are used in many real life things such as smart health,smart city,smart transportation and so many application are used in daily life.These IOT application services can access any where ,anytime and for anyone.Todays generation this IOT based applications are most usefully and important in daily life scenario.through that IOT application digital things can easily handle.

A. AIR POLLUTION MONITORING

Air Pollution is one of the major environmental problems nowadays.

The Air pollution affects the humans, plant and animals in term of diseases. The main causes of air pollution is the vehicle unburnt fuel, the industrial waste.as shown in fig2 user can monitor the air pollution through wifi connected android mobile application. with the help of air pollution monitoring system we can easily predict the nature pollution .with the help of this application humans knows the quality of air and which is the best or suitable to us. once monitor the air pollution through this mobile application the person can avoid to go the polluted area and aware that area.so this is the best benefits of this application.

Fig. 2. Air Pollution Monitoring on smart phone

B. SMART HOME AND BUILDINGS

By the concept of this smart home and buildings many devices can operate the things smartly under home and buildings.the smart lighting,smart tv,smart envoironment, media, air control,energy management are the interesting application in smart home and buildings. with the help of smart home and buildings it easy to handle many things like smart TV,smart light,smart air control,smart wifi technologies that can easily managed through this smart home iot application. many new technologies are include this smart home using many home application one of the example is Alexa. with the help of alexa device we can command to many things that we want to handle with the help of this smart home iot application .One of the most important smart home device is connected to door locks so to avoid the unfortunately crime such as bulglary and theft so we can protect our home smartly with the help of this iot door lock system. as shown in Figure 3 below.
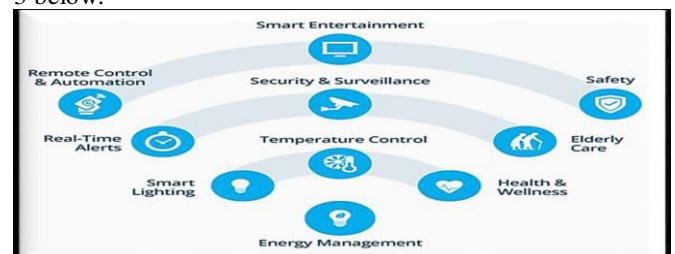

Fig. 3. Smart Home & building application

C. SMART ENERGY AND SMART GRID

A smart grid application take place a two way communications between the suppliers and consumers, in the smart grid the Informations and communication technology enables a real time electricity network.With the help of this smart energy application electricity can supplies more efficiently and sustainably.the electricity power issues automatically detected through this smart energy application using IOT.

Fig. 4. Smart Grid

Many application can be handle under the smart grid using internet of things such as industrial,vehicles,solar power,nuclear power,hospitals,cities power control etc.Fig 4 is shows the important applications in smart grid application using IOT.

Iot can be used with various technologies for various areas such as smart healthcare, smart agriculture, smart monitoring, smart transportation. smart water management etc. even if Iot can be used to make environment healthy and green.

D. SMART TRANSPORTATION

This smart transportation application is very important part in todays world to control traffiic jam notification, signal notification, route map, that easily detect to us with help of this smart transportation iot application. The T-CPS Transportation cyber physical system are under the smart transportation. The Smart transportation system monitor the traffic jam, signals notification and also give the real time traffic summery. In smart transportation system the vehicles are connected to the v2v communication that's is vehicular to vehicular communication. In todays scenario there are many smart vehicles are notify the summery of transportation e.g is audi, google, Volvo and USDOT.
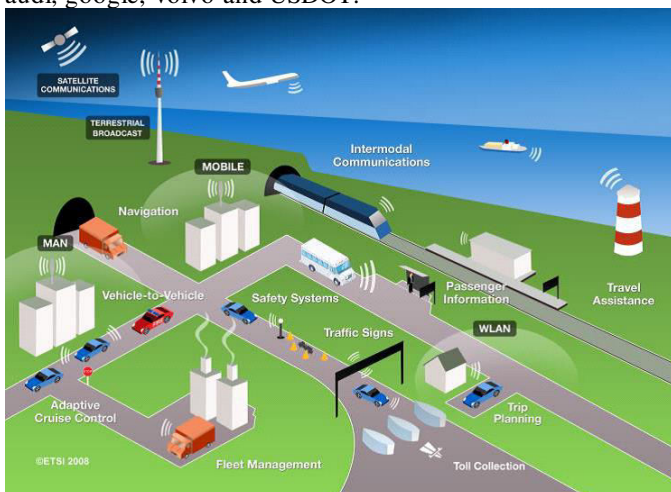

Fig.5.Example of Smart Transportation in IoT

E. SMART AGRICULTURE

Nowadays the agriculture is most major industries. every one is depend on the agriculture by day to day life. smart agriculture in iot application change the whole effort of humans. every object in smart agriculture is connected with Internet of things and that make the agriculture more effective and give more crop yield productivity. The agriculture in iot include following parts:

- **Precision Farming**
- **Agricultural Drones**
- **Livestock Monitoring**
- **Smart Greenhouses**

In the smart agriculture many techniques are used such as soil nutrient testing, crop predictions, instrusion detection etc. with the help of this smart agriculture application farmer can easily get the information about there crop productivity, farmer can easily do the field monitoring using this application. Live information of the crop is easily available to the farmer. smart agriculture application is more beneficial to the farmer for the better crop production.

Monitoring of Climate Conditions. Probably the most popular smart agriculture gadgets are weather stations, combining various smart farming sensors.

- Greenhouse Automation.
- Crop Management.
- Pest Monitoring and Management

Fig.6.Agriculture in IOT

F. SMART WATER

The Water conservation is the very important factor in Smart water application. the iot sensors are used in taps and with the help of that sensors taps its detect the humans presence to taking showers this is help to save the water wastage.to saving a wastage water the smart water iot application is best things. with the help of multiple water detecting sensor water wastage can control.to provide water proper and suitable without any wastage. Smart water sensors measures the temperature, pressure, quality etc. It can also detect the leakage in faulty pipelines in home with the help of sensor its send the

notification to the owners. Smart water is collect meaningful information about the flow, pressure and distribution.

Fig.7.NB-IoT enables smart water

G. SMART ENVIRONMENT

The Environment plays major role in human life. People, animals, fishes, plants and birds may affected unhealthy environment. There are many researches effort has been paid to solve problem of environment pollution and waste resources.because of industries and transportation creating healthy environment is not so easy .irresponsible human activity are daily damaged the environment. The environment needs a smart ways and new technologies for monitoring and management. the waste management is control with the help of smart environment. example is E-wastage dustbin.that dustbin automatically give notification if this bin is full with wastage.perticular threshold level is adjusted in sensor and beyond that level they send notification to waste management center. The fig 8 is shows the Smart environmental indicators such as water and air pollution, weather and radiation monitoring, waste management, natural disaster and many others.
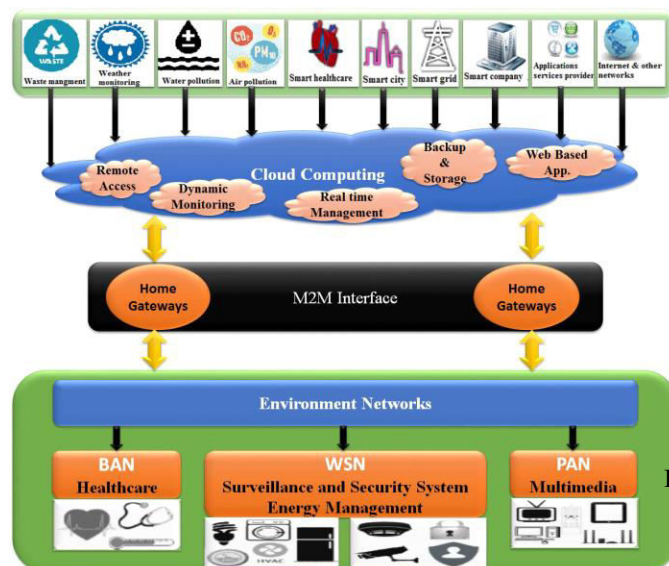

Fig.8.Smart Environment based internet of things

H. SMART HEALTHCARE

Medical facilities and healthcare are primary needs for every aged people .Elder people need more care of our health as compare to young one. The smartness is necessary for medical quipment the mesimo radical is help to monitor different physiological statistics of patients like diabetes, temperature, blood pressure, heart-beat etc. and communicate to servers and then to concerning medical staff to take action accordingly. The sensed data collected from body of patient transmitted to doctor's smartphone or terminal.one of the real time example of smart healthcare I explain here there is one heart patient at night 2 pm patient start the chest pain may be it can be a heart attack, if there is a iot based implemention then its work like this, lets one band is attached with that patient hand(hand belt)that belt are connected with the sensor and that sensor continuously monitor the heart beat health of that patient.so that band work properly and immediately gives false reading about there heart health that means there is some major changes are happens on that patient heart.so now how iot work in this situation, first the notification goes to the nearest hospital with the help of that location track by the sensor. with the help of that location tracker nearest hospital will notify regarding the detail of health of that patient like what type symptoms notice etc. all information related to that patient health goes to that doctors through that smart iot technologies and according to the status of that patient health all equipment are ready in hospital before reach the patient in hospital. The summery says that iot is work more effective and faster than manual process.
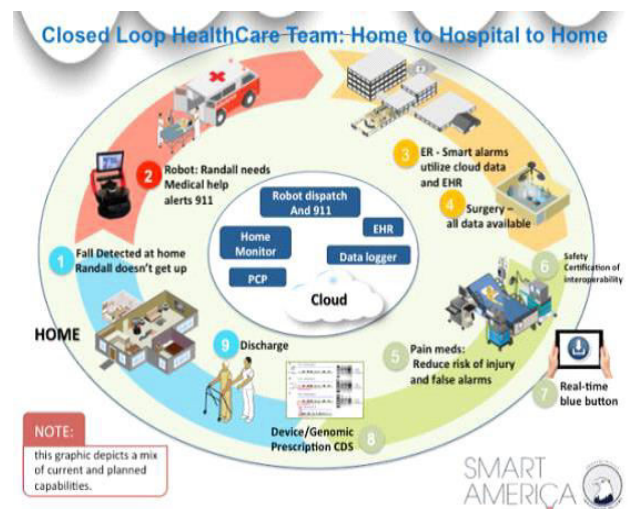

Fig.9.Example of smart healthcare in IoT

IV. INTERNET OF THINGS CHALLENGES

There are many challenges are happens on internet of things. Each and every application the cost of implementation

perform the some challenges to perform actual automatic work through IOT. Following challenges are faced IOT.

Scalability: -The IOT Requires a new function such as to gain an efficient operation for scalability for small as well as large scale environment.

Self-Organizing: The smart things is not managed by computer so it's required the user to configure and adopt then into a particular situations. The IOT things are able to organize the things by own itself that is self-organizing.

Data volumes: The Data volume challenges is term represent the big data phenomenon. This requires the operational mechanisms to addition of new technologies for processing, storing and management.

Data interpretation: In the data interpretation need to draw some generalization conclusions.

Security/Personnel Safety: It is very important challenge. User data could be vulnerable for theft. The poor security features will harm the whole networks the attacker can easily attack when it is a poor security application.

Privacy: As you are 24*7 connected in the internet so anyone will monitor and tracked you easily. Trouble integrating devices into the environments without people using them consciously is a major challenge when it comes to privacy.

Other aspects consider as Iot challenges to implement such as Automatic Discovery, Software complexity, Security and privacy, Fault tolerance, Power supply etc.

V. IOT AND RELATED FUTURE TECHNOLOGIES

There are many new future technologies are implemented through the IOT. The future technologies in IOT makes iot more advanced. We can discuss here few future technologies of IOT below.

1.AI(Artificial Intelligence) and IOT: This are the combination of the AI and IOT both. Iot will gathered and handling the data and that generated data will give to the AI algorithms and that AI algorithms perform an action and gives us the useful action or result. And that useful action are further create a useful application under IOT.

2.VUI(Voice User Interface): In the IOT this VUI technologies are come that will help to recognize the voice easily through sensors. Its simple technology that user will not type or write anything's just you speak and you got the result as an output e.g. Alexa, google.

3. Miniaturization of Things: In this technology smart devices can converted in to small or mini devices. That is macro or nano device. This technology are beneficial to the IOT application in future that user can handle devices easily from anyplace. With maintain the efficiency and performance.

4.Power: Iot devices will be a lower power devices in future. That will consume the energy. And give the better output. In future we used the solar cell and wind energy concept. And with the help of that we can operate IOT devices.

5. Big Data and IOT: It is the combination of the big data and IOT. In the universe day by day many iot devices will add and according to that IOT devices huge amount of data also generated over the network and that is called the big data.in future technology the big data is most important to deal with this Iot applications.

VI. CONCLUSION

The internet of things promises future new technologies when related to cloud, fog and distributed computing, big data, and security issues. By integrating all these issues with the internet of things, smarter applications will be developed to make smarter life. The iot is says that is give us the new technology and that provide smart techniques that consume time more. And in future iot improve more with including cloud, fog and distributed computing.

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