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Impact of Internet in Our Life with IOT

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***Abstract*-- Over the last decade Internet has made significant impact in our economies and societies by bringing in remarkable communication and networking infrastructure. The world-wide web has been a major driver of global information and media sharing.**

The Internet of Things (IOT) describes a worldwide network of intercommunicating devices. It integrates the ubiquitous communications, pervasive computing, and ambient intelligence. At this point (IOT) must be seen as a vision where "things", especially everyday objects, such as nearly all home appliances but also furniture, clothes, vehicles, roads and smart materials, and more, are readable, recognisable, locatable, addressable and/or controllable via the Internet.

The primary aim of this study was to understand the actual area of improvement in Patna and the awareness among the people. To achieve this questionnaires were distributed.

***Keywords*-- IOT, IOE, Smart Economy, Smart People, Smart Governance, Smart Mobility, Smart Environment, Smart Living, Citizens.**

I. INTRODUCTION

The internet of things (IoT), is the internetworking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. In 2013 the Global Standards Initiative on Internet of Things (IoT-GSI) defined the IoT as "the infrastructure of the information society." The IoT allows objects to be sensed and/or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit.

The Internet of Things (IoT) is not a futuristic technology trend: It's here today, and it starts with your things — your devices and sensors, the data they produce, your cloud services and business intelligence tools. That's the Internet of Your Things. By implementing a strategy to capitalise on the Internet of Things, you can stop just running your business and start making it thrive.

Internet of Things (IoT) makes our world as possible as connected together. Nowadays we almost have internet infrastructure wherever and we can use it whenever. Embedded computing devices would be exposed to internet influence. Common instances for embedded computing devices are MP3 players, MRI, traffic lights, microwave ovens, washing machines and dishwashers, GPS even heart monitoring implants or bio chip and etc. IoT tries to establish advanced connectivity (with the aid of internet) among these mentioned device or systems or services in order to little by little make automation in all areas. Images that all things are connected to gather and all information would be interacted to each other over standard and different protocol domain and applications.

In a nutshell IoT wants to connect all potential objects to interact each other on the internet to provide secure, comfort life for human.

Recent researches shows by 2020 we have over 20 billion devices which uses IoT. IoT does that because of controlling on device and lower expense on radio. But these huge fields makes challenges such as lacking IP address, developing compatible and useful protocol and environment.

II. NEED OF I O T

1. Environmental Monitoring

Simple example is: You surly noticed by now that you surf the net and suddenly when open your Gmail you see some interesting thing which are near to your favorite or in Facebook when you like page, on the right section similar content page will be appeared. These are common and tangible but image when we can monitor all embeds computing system to improve our life. Such as

1. With the aid of water or soil or air measurement device can say us how are well for which plant.
2. With the aid of earthquake or tsunami warning systems we can prevent less damages and victims.
3. We can monitor wild life habit and by this tracking prepare them their desire condition and prevent their extinction.

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2. Infrastructure Management

Infrastructure Management is useful for monitoring and tracking if there is any problem in urban or rural Infrastructure such as bridge, railway or etc. to diminish and reduce risk of dangerous and any failure in strength would be tested and alarm as soon as possible to repair it.

3. Industrial Applications

Industrial Applications investigate the quality of product in order to real-time optimizing to have a good marketing such as who are most interested to which product and how this product can find marketing with which tiny change.

4. Energy Management

Energy Management are categorized with systems which are connected to internet and with some sensor to reduce power consumption such as cloud based, remote control for oven , lamp and etc.

5. Medical and Healthcare Systems

Healthcare Systems helps to improve patient state better by monitoring and controlling their heart rate or blood pressure or even for their diet. Smart tablet which show us how much does with which gradient can helps patient to get better.

6. Building and Home Automation

It is related to everything in home which have the potential to monitor and remote control such as air condition , security lock lightening, heating, ventilation, telephone system, TV to make a comfort , secure , with low energy consumption.

7. Transport Systems

Which fine driver Transport Systems makes regular city and environment without less employer for police or station such as automatic configuration in traffic lights, smart asking , traffic camera to detect which road has heavy traffic and offer automatically less crowd road, or smart camera in high speed.

8. Large Scale Deployments

There are cities where are almost complete smart cities with wide range of using IoT and covering wireless ex - Santander, Spain and New York , US.

III. Working Methodology Of I O T .:-

Internet, things, Internet of things, Internet of Everything! These are some of the buzzwords you may have been hearing, reading & very likely talking about endlessly.

These are more than just keywords; IoT (Internet of Things) is a technology concept and/or an architecture which is an aggregation of already available technologies.

Similar to the way in which Internet has changed the way we work & communicate by connecting us (humans) through World Wide Web, IoT aims to take this connectivity to next level by connecting various devices to the internet – facilitating human-machine, machine-machine interactions also.

The visionaries have also realized that this IoT ecosystem has business applications in areas of Home Automation, Automotive, Factory/assembly line automation, Retail, Medical/Preventive healthcare and more.

Now that we all understand the IoT concept, it would be worthwhile to deep dive in order to get familiar with the building blocks of IoT:

IoT-Architecture_Embitel-Technologies_IoT-Gateway_Cloud-servers_Mobility

1. *Sensors & Sensor technology* – They will sniff a wide variety of information ranging from Location, Weather/Environment conditions, Grid parameters, Movement on assembly lines, Jet engine maintenance data to Health essentials of a patient.
2. *IoT Gateways* – IoT Gateways, as the name rightly suggests, are the gateways to internet for all the things/devices that we want to interact with. Gateways help to bridge the internal network of sensor nodes with the external Internet or World Wide Web. They do this by collecting the data from sensor nodes & transmitting it to the internet infrastructure.
3. *Cloud/server infrastructure & BigData*–The data transmitted through gateway is stored & processed securely within the cloud infrastructure using Big Data analytics engine. This processed data is then used to perform intelligent actions that make all our devices 'Smart Devices'!
4. *End-user Mobile apps* – The intuitive mobile apps will help end users to control & monitor their devices (ranging from room thermostat to jet engines & assembly lines) from remote locations. These apps push the important information on your hand-held devices & help to send commands to your Smart Devices!
5. *IPv6* – IP addresses are the backbone to the entire IoT ecosystem. Internet is concerned about IP addresses only & not if you are a human or a toaster. With IPv4 we were running out of IP addresses, but with IPv6 (launched in 2012) we now have 3.4*10^38 IP addresses!

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Telecommunications industry

IOT will create the possibility of merging of diverse telecommunication technologies and create new services. An illustrative example is the use of GSM, NFC (Near Field Communication), low power Bluetooth, WLAN, multi-hop networks, GPS and sensor networks together with SIM-card technology. In these types of applications the reader (i.e. tag) is a part of the mobile phone and different applications share the SIM-card. NFC enables communications among objects in a simple and secure way just by having them close to each other. The mobile phone can therefore be used as a NFC-reader and transmit the read data to a central server. When used in a mobile phone, the SIM-card plays an important role as storage for the NFC data and authentication credentials (like ticket numbers, credit card accounts, ID information etc.). Thing can join networks and facilitate peer-to-peer communication for specialized purposes or to increase robustness of communications channels and networks.

Medical and healthcare industry

IoT will have many applications in the healthcare sector, with the possibility of using the cell phone with RFID-sensor capabilities as a platform for monitoring of medical parameters and drug delivery. The advantage gained is in prevention and easy monitoring of diseases, ad hoc diagnosis and providing prompt medical attention in cases of accidents.

Pharmaceutical industry

For pharmaceutical products, security and safety is of utmost importance. In IoT paradigm, attaching smart labels to drugs, tracking them through the supply chain and monitoring their status with sensors has many potential benefits. For example, items requiring specific storage conditions, e.g. maintenance of cool chain, can be continuously monitored and discarded if conditions were violated during transport. Drug tracking and pedigrees allow for the detection of counterfeit products and keep the supply chain free of fraudsters. Counterfeiting is a common practice in this area, and it particularly affects the developing countries. The smart labels on the drugs can also directly benefit patients, e.g. by enabling storing of the package insert, informing consumers of dosages and expiration dates, and assuring the authenticity of the medication.

The Internet of Things technology (IoT) in education

Technology has changed the educational landscape. From the use of tablets in the classroom to the proliferation of open universities, education looks very different campuses, improve access to information and much more.

From K-12 up to postgraduate programs, the IoT has the potential to impact every aspect of student learning.

As educational organizations begin to leverage solutions like cloud computing and radiofrequency identification (RFID) across an IoT platform, they're able to capture, manage and analyze Big Data. This insight provides stakeholders with a real-time view of students, staff and assets. It is this **asset intelligence** that enables institutions to make more informed decisions in an effort to improve student learning experiences, operational efficiency and campus security today. With the advent of mobile technologies, schools can now keep track of important resources, create smarter lesson plans, design safer.

ID cards and wristbands allow educational organizations to store the last-known location of a student or visitor, helping to ensure the right people are accessing the right areas on campus.

Challenges

Today, connected objects are still in their early stages and there are still many challenges to be overcome before the benefits of connected objects can be fully realized. At present IOT is faced with many challenges ,such as:-

- Scalability
- Inter operability
- Discovery
- Software complexity
- Data volumes and interpretation
- Power supply
- Interaction and short range communication
- Wireless communication
- Fault tolerance

Addressing and Tagging

The IoT should be able to tag or address about 50 to 100 trillion objects. To achieve this, the current IPv4 protocol will be insufficient. A key challenge is to agree on a common way of addressing and identifying objects.
It is also important to have unique UIDs (user-ids), even for mass- produced objects (i.e. all objects coming out of a factory will have their own unique UID, not a common one). The relationship between objects, such as raw material (one UID) becoming refined material (another UID) or parts (each with their own UID) that are then assembled as a car (again a different UID) also needs to be considered to enable us to follow these relationships and thus maintain traceability.

Connectivity

When dealing with the IoT, one usually concentrates on the devices themselves. Connectivity is often missed, which is a big mistake.

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Connectivity in the IoT will mostly be wireless, using many possible solutions (Wi-Fi, GPRS, 3G, Wireless HART, Zigbee, Bluetooth, etc.)

As each of these solutions has different pros and cons, they will the likely all coexist in future. (Zigbee requires very little power, but has a limited range; 3G has almost complete coverage, but is expensive both in terms of hardware and usage).

When using 3G, there is usually a cost associated with the usage of data transmission. It is therefore important to optimize communication with devices.

Privacy concerns

One of the main concerns that the IoT has to address is privacy. The most important challenge in convincing users to adopt emerging technologies is the protection of data and privacy. Concerns over privacy and data protection are widespread, particularly as sensors and smart tags can track users' movements, habits and ongoing preferences.

Invisible and constant data exchange between things and people, and between things and other things, will take place unknown to the owners and originators of such data. IoT implementations would need to decide who controls the data and for how long. The fact that in the IoT a lot of data flows autonomously and without human knowledge makes it very important to have authorization protocols in place to avoid misuse of data. To promote a more widespread adoption of the technologies underlying the IoT, principles of informed consent, data confidentiality and security must be safeguarded. These kind of issues are addressed by the EPC-IS groups.

Some of the other privacy risks involve the direct collection of sensitive personal information, such as precise geo location, financial account numbers, or health information –risks already presented by traditional Internet and mobile commerce. Others arise from the collection of personal information, habits, locations, and physical conditions over time which may allow an entity that has not directly collected sensitive information to infer it.

Current status and future Prospect of IOT

To ensure that the opportunities and benefits related to IoT are global, the specific needs and potential challenges related to emerging economies must be considered. The matters discussed in the preceding issue sections are not unique to industrialized countries, and should be considered applicable to developing Markets as well. However, the unique circumstances often found in emerging economies raise additional Questions about maximizing the benefits and managing challenges of IoT. While by no means exhaustive, Some areas for consideration include:

a) Infrastructure Resources: Internet and communications infrastructure has spread rapidly across the developing world, yet gaps remain in ensuring reliable, high-speed, and affordable access in many countries, including for commercial and business use. To what extent will the Internet of Things place pressure on Internet and telecommunications infrastructure and resources? Will current challenges curb the opportunity for IoT in emerging regions, or could IoT be a demand-driver for additional build-out of infrastructure? Does special attention need to be paid to spectrum management, given that wireless technology underpins many IoT implementations? As cloud services and related data analysis drive value in many IoT services, will the relative lack of data center infrastructure in emerging economies hinder deployment?

b) Investment: In industrialized countries, investment in IoT research and product development is being driven by market opportunities for products and services. To what extent will the market drive investment in IoT implementations in developing countries, especially beyond applications in industries and settings that have the prospect of clear, near-term returns? On the other hand, could IoT deployments in emerging economies be more efficient and cost effective, and even leap-frog technology in the rest other world, as fewer legacy systems are often in place? Is there a role for governments to incentivize the development of innovative technical solutions by local researchers and local industries?

c) Technical and Industry Development: To what extent are researchers and entrepreneurs from developing countries involved in IoT technical development and deployment? What should be done to encourage participation in development of technical solutions and applications that meet the needs and opportunities of these markets, while being respectful of cultural norms, and building in appropriate levels of security and privacy protection? What new skills may be required in emerging economies to build, deploy, and manage IoT systems? Are industries in emerging economies ready to benefit from IoT technology? Will they be left behind or are they better positioned to leap-frog older industrial technologies? How can researchers and industries in countries with emerging economies be positioned to develop solutions to local economic and social challenges that have direct impact on their societies?

d) Policy and Regulatory Coordination: Policymakers and regulators in emerging economies have made significant progress over the past 10 years to develop and adapt policies and regulations to encourage Internet growth and address related challenges.

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Advantages of IOT

• *Automation of daily tasks leads to better monitoring of devices:*

The IoT allows you to automate and control the tasks that are done on a daily basis, avoiding human intervention. Machine-to-machine communication helps to maintain transparency in the processes. It also leads to uniformity in the tasks.

• *Efficient and Saves Time:*

The machine-to-machine interaction provides better efficiency, hence; accurate results can be obtained fast.

• *Saves Money:*

Optimum utilization of energy and resources can be achieved by adopting this technology and keeping the devices under surveillance.

• *Better Quality of Life:*

All the applications of this technology culminate in increased comfort, convenience, and better management, thereby improving the quality of life.

Disadvantages of IOT

• *Loss of privacy and security:*

As all the household appliances, industrial machinery, public sector services like water supply and transport, and many other devices all are connected to the Internet,a lot of information is available on it.

• *Compatibility:*

As devices from different manufacturers will be interconnected, the issue of compatibility in tagging and monitoring crops up. Although this disadvantage may drop off if all the manufacturers agree to a common standard, even after that, technical issues will persist.

• *Complexity:*

The IoT is a diverse and complex network. Any failure or bugs in the software or hardware will have serious consequences. Even power failure can cause a lot of inconvenience.

• *Lesser Employment of Menial Staff:*

The unskilled workers and helpers may end up losing their jobs in the effect of automation of daily activities.

• *Technology Takes Control of Life:*

Our lives will be increasingly controlled by technology, and will be dependent on it. The younger generation is already addicted to technology for every little thing.

We have to decide how much of our daily lives are we willing to mechanize and be controlled by technology.

IV. Main Result

While the concept of combining computers, sensors, and networks to monitor and control devices has been around for decades, the recent confluence of key technologies and market trends is ushering in a new reality for the "Internet of Things''. IoT promises to usher in a revolutionary, fully interconnected "smart" world, with relationships between objects and their environment and objects and people becoming more tightly intertwined. The prospect of the Internet of Things as a ubiquitous array of devices bound to the Internet might fundamentally change how people think about what it means to be "online".

While the potential ramifications are significant, a number of potential challenges may stand in the way of this vision – particularly in the areas of security; privacy; interoperability and standards; legal, regulatory, and rights issues; and the inclusion of emerging economies. The Internet of Things involves a complex and evolving set of technological, social and policy considerations across a diverse set of stakeholders. The Internet of Things is happening now, and there is a need to address its challenges and maximize its benefits while reducing its risks.

The Internet Society cares about IoT because it represents a growing aspect of how people and institutions are likely to interact with and incorporate the Internet and network connectivity into their personal, social, and economic lives. Solutions to maximizing the benefits of IoT while minimizing the risks will not be found by engaging in a polarized debate that pits the promises of IoT against its possible perils. Rather, it will take informed engagement, dialogue, and collaboration across a range of stakeholders to plot the most effective ways forward.

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