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Future of the Internet of Things (IoT) in India

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Abstract: The introduction of IoT in India has brought the next level of industrial revolution also known as Industry 4.0. IoT plays a leading role in an evolving IoT business and technology context besides in the new Digital India program launched by the Government. According to a recent report, IoT investments in India were close to USD 5 Bn in 2019, and this is expected to go up to USD 15 Bn in 2021.

INTRODUCTION

IoT is essentially a platform where embedded devices are connected to the internet, so they can collect and exchange data with each other. It enables devices to interact, collaborate and, learn from each other's experiences just like humans do.
IoT, Industrial IoT and Edge Computing are growing at an incredibly fast pace and have become an integral part of our daily lives through applications such as intelligent tracking systems in transportation, industrial wireless automation, public safety, personal health monitoring, and health care for the aged community. The potential is seemingly endless. We are living in the future that we once thought was a lifetime away.
Since IoT devices are connected to the web, they can be hacked just like any other internet-enabled device. Such a high level of device connectivity being brought into businesses can create a significant data security risk. With past security alert incidents like hackers shutting down IoT gadgets, and security attacks against enterprise infrastructure, electrical grids, dams, etc., it seems that IoT security may not just be about home or enterprise data security but also national security.

Top IoT trends in India 2020-21
Smart Cities: Smart Cities is everyones choice today. Thanks to IoT, Smart Cities will continue to expand its reach with hi-tech technologies that will leverage data of IoT devices between entities. IoT provides scope for better cities which entails smart lighting, automated parking, environment sensible to check pollution levels, smart irrigation, waste generation, walkable localities and smart homes to make better use of infrastructure, ensure the safety of residents and help in the resource management efficiently.

Smart Factories: IoT can boost productivity by enabling automation and real-time data analytics and ensure seamless operations with high-quality output by optimizing workflows and detecting errors missed by the human eye. It can also help to save production time and track assets in the factory and help consolidate control rooms.
Data-Driven Healthcare: Using IIoT, Healthcare service providers can access real-time data to remotely monitor patients and mitigate the risk of diseases. As a result, the healthcare workforce can focus more on research, learning, and patient fulfilment.

Artificial Intelligence (AI): AI capabilities allows businesses to extract more value out of their massive collection of data. AI will analyse the data collected through IoT devices in various ways such as data preparation, visualization of streaming data, real-time location, predictive analysis and so forth.
Data Processing with Edge Computing: Edge Computing stores data on a local device near the IoT device, before sending it to the cloud that can be used for sorting and calculating the data. In the coming years, more organizations will adapt edge computing with affordable edge devices as there will be less bandwidth consumption by IoT devices using Edge Computing.

Smart Retail: Retail experience is getting smarter and better with utilization of RFID (Radio Frequency Identification Tags) and use of IoT devices. By using IoT devices, store managers can find out the way visitors spend their time in the stores, can track their movements and analyse, and manage inventory well.

Fitness: Real-time data from fitness trackers and health devices can provide qualitative life by monitoring health conditions like blood pressure, blood sugar level, heartbeat rate, etc. In an emergency, healthcare smart devices can issue alerts to the concerned person/department.

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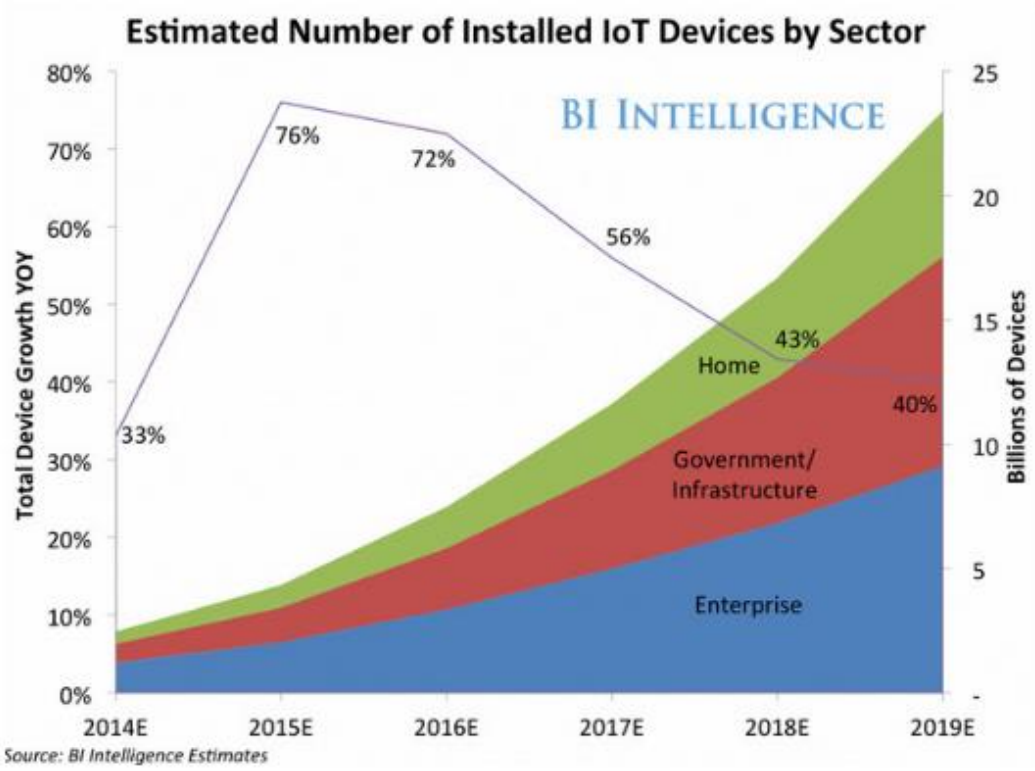
What is the Future of IoT in India

Growth of the Internet of Things is expected to peak in 2015:



Original graphic from: Goldman Sachs

The Internet of Things (IoT) is lauded by most as the next great revolution in technology. A world where every object we use has a sensor, enabling it to connect to the internet so it can communicate with each other and the user is a world that seems like something out of science-fiction. With the Internet of Things fast approaching, that world could become a reality very soon.

Experts estimate that the IoT market could be worth as much as $1.7 trillion by 2020, with more than 50 billion devices connecting to the IoT by that time. But where will much of that growth come from? The U.S. is always near the forefront of technological developments, and China is in the middle of a massive economic expansion, but some are saying India will be the place to look for IoT growth, even becoming the largest consumer of IoT devices in five years. While some dispute the claims, it's clear the future is bright for the IoT in India.

Part of the push to maximize the potential of the Internet of Things in India is coming from the national government. Collaboration between the Department of Electronics and Information Technology and the Ministry of Urban Development has resulted in an emphasis in programs designed to expand the capabilities of the country in using the IoT. Some of these initiatives include the support of smart cities (or cities that use IoT devices to manage traffic, utilities, and other aspects), healthcare IoT sensors for monitoring health, and Indian Railways. In the Indian Railways example, IoT devices on the trains communicate through the cloud to indicate fuel consumption. This information can be used to increase the efficiency on India's railroads.

A number of startups have arisen in India seeking to harness the potential of the IoT. One company called CarIQ manufactures a device that turns normal cars into smart cars. This IoT device records and analyzes data like mileage and speed while also taking into account driving patterns, all while communicating with other cars. The device made by LifePlot is similar to the Indian government's healthcare initiative, in which the connected device is able to record medical data about a patient, providing remote diagnosis with little training needed. These are just a few examples of companies fully utilizing the potential of the Internet of Things.

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Though challenges still remain, the future of the IoT in India is a promising one. The government is fully backing the effort to develop better infrastructure, companies are coming out with innovative products, and industries understand the benefits the Internet of Things provides. With more time and resources, IoT progress could prove to be impressive on a large scale. If that progress continues, the prediction about IoT use in India may come true after all.

IOT APPLICATIONS INDUSTRY WISE

1. Industrial and Manufacturing

Traditionally, the industrial and manufacturing sector has been under the purview of operations technology (OT) that involves hardware and software tools to monitor physical devices. It has been concerned with yield metrics, uptime, real-time data collection and response, and system safety. With IoT in place in the industrial and manufacturing sector, OT will combine with IoT to provide powerful IIoT solutions.

IoT use cases in Industrial and Manufacturing

Real time asset monitoring: Manufacturing companies are using IoT to connect machines and systems together. This makes monitoring of equipment reliable and in real-time, benefitting compliances and safety. Preventive maintenance of factory machinery: If a machine goes down, IoT connected sensors can automatically pinpoint where the issue is occurring and raise an alert. IIoT can also help a manufacturer predict when a machine will likely breakdown or enter a dangerous operating condition before it ever happens. This is an invaluable help in maintaining manufacturing continuity, especially for those with continuous operations like the automobile industry.

Asset Tracking: Another area in which IoT is useful is asset tracking. It does so by allowing an enterprise to locate and monitor key assets

Safety systems: Thermal sensing, pressure sensing and gas leaks are some areas where IoT enabled detectors improve plant safety

2. Consumer

The consumer sector was one of the first sectors to latch on to the IoT revolution. Mobile operated devices, virtual voice enabled assistants like Alexa and Siri are examples of how IoT is changing the way people interact with their devices. Likewise, an activity tracker like Fitbit is another example of how we have accepted IoT as part of our daily regime. Blue tooth operated car music systems that let you play your favourite music from YouTube channel via the cell phone is another example of consumer IoT at work. After industry, manufacturing and healthcare sector, consumer and FMCG are the next sectors that have found value in IoT.

IoT use cases in Consumer Sector

Smart home gadgetry: smart garden irrigation, smart garage doors, smart locks, smart security, smart TV, etc.

Wearables: like health and activity trackers, smart wearables

Pets: pet location systems, smart dog doors

3. Banking Services

At first, it seems difficult to visualize how IoT can be helpful in the banking sector. This is especially true as banks are not known to adapt to new technology quickly. They are relatively slow in implementing anything new and innovative. However, banks are now indeed catching up with the rest of the sectors, and are exploring innovative ways that IoT will help them in serving customers in a better manner. Here are a few cases where IoT will prove to be useful to the banking sector.

IoT use cases in Banking

Improved payment security: security is of paramount importance to the banking sector. Reputations are made or tarnished by how secure or insecure a bank is. With electronic banking being accepted as the de-facto standard, transactional security is very important, Banks will devise new forms and tools for payment (like biometric tokens, smart cards, etc.) with the help of IoT that will make ATM-based transactions redundant. It is also envisaged that IoT will empower wearable payment systems that will replace cards, which can be lost or stolen.

Better transparency: IoT enabled banks can procure detailed customer data like loan history and asset details almost instantaneously; improving decision making system for granting loans. This will in turn make the loan procurement process more transparent.

Voice assistance: Customers can ask questions like ‘How much money do I have in my bank wallet?’ and ‘When is my next electricity bill payment due?’ to voice assistants powered by IoT. Using shock wearable devices: a bank has come up with an innovative idea. They have provided customers with a wearable device that tracks their credit card usage. It generates a mild shock as a reminder if it exceeds the limit set by the customer.

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4. Finance and Retail

By its very nature, finance is intangible and complicated, subject to many risks. Enterprises can leverage the power of IoT to mitigate some of the risks associated with this sector.

IoT Use cases in Finance and Retail

Insurance tracking of asset: A telematics box measures various aspects of a customer's driving habits and transmits this data to the insurer. The insurance company can then analyze it to learn how safe or rash the customer drives and adjust their insurance premium accordingly.

Inventory levels and logistics alerts: IoT enabled devices can be installed in the warehouse that gives an alert when a specific item goes below the threshold limit. Where the inventory is huge, it will also alert about the item's whereabouts within the warehouse. When goods are transported, IoT enabled trucks will know exactly when the truck is loaded to its capacity, what the fuel levels are, whether the tyre pressure is correct and the best route to take in order to reach a destination.

Storage Monitoring: IoT can analyze and monitor perishables that are stored in a cold storage unit and apply predictive analysis to food supply

Beaconing Systems: Beacons work by finding or identifying items and locations. They do this by sending Bluetooth low energy or RFID (Radio Frequency ID) signals. Beacons allow for a new way of in-store interaction between customers and retailers. Another use case is stadiums, where they assist spectators in locating their seats. Likewise IoT enabled beaconing systems allow passengers at an airport to locate their gate correctly, or give them relevant airline offers.

5. Healthcare

Healthcare is one more important sector where IoT is making a significant impact. Since IoT enables remote and flexible monitoring of patients, it is in much demand in the current Covid 19 pandemic. Once the technology is fully developed and adapted by the healthcare sector, advanced analytics and machine learning tools will observe patients in order to diagnose illness and prescribe treatments. They can also be used to monitor life-critical care.

IoT use cases in Healthcare

Wearable healthcare monitors: from monitoring heart rate to counting calories burned while exercising, IoT enabled healthcare gadgets have made health monitoring simple.

Contactless Thermometers: The coming of Covid 19 has given a tremendous impetus to the use of contactless thermometers, which is providing doctors and nurses a safe way to monitor body temperature of patients.

Predictive healthcare: IoT enabled portable blood analyzers, EKG devices, ultrasound imaging devices, etc. are helping patients improve their life by providing timely and accurate health data.

Some Big Players in IoT industry in India

1. Hyperlink InfoSystem
2. Tata Consultancy Services
3. HCL Tech
4. Tech Mahindra
5. L&T Infotech
6. Infosys
7. Wipro
8. Mphasis
9. HData Systems
10. Capgemini

CONCLUSIONS

At an average of 2 electronic devices used by every Indian. We are talking at least 2 billion connected devices. One of which will be mobile phone and the second can be a tv, refrigerator, automobile, tube well, watch which can be your central nodes and innumerable controlled or connected nodes.

While automobile, industry and healthcare remain the mainstay of IoT use cases, other sectors are fast catching up. It is pertinent to note here that IoT impacts in other ways too by providing green energy solutions, reducing costs, reducing time to market, improving supply chain logistics and reducing production loss and increasing productivity.

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