EXECUTIVE SUMMARY (Internet of Things)

The Internet of Things, or IoT, refers to billions of physical devices around the world that are given web presence. In internet of things a single constrained device connects to a wide range of devices, all connected by some IoT protocols. These protocols let devices and servers talk to each other. The devices can be uniquely identified through their embedded computing systems, but they are also able to inter-operate in the existing Internet infrastructure.

IoT Architecture:

Objects layer: Sensors collect data from the objects and turn this data into useful data.
Object abstraction layer: In this layer the data acquired by the object layer is transferred to the service management layer using secure channels. Data can be transferred using technologies like 3G, 4G, GSM, Wi-Fi, Bluetooth, etc.
Service management layer: This layer enables programmers to work with these objects, irrespective of the hardware platform.
Application layer: This layer enables high-quality smart services to fetch information according to customer requirement and needs.
Business layer: This layer helps to manage overall activities and services of an IoT system. It is responsible for making business model, flow-charts and graphs based on data that is acquired at the application layer.

Challenges: How enterprises think of IoT has many layers in it. The basic idea of IoT is to collect the data; analyze the data; and generate the insights to re-engineer processes and realize benefits. To do all these things, it needs 24X7 internet connection. It seems easy in theory, but IoT deployments are challenging. The most promising challenge is security and privacy of the data. The smarter devices and sensors you connect to the internet, the more potential there is for hackers to find a way into sensitive systems. There is inability to link all the data together and process it effectively. Incompetence in establishing same technology standards to make all connected devices 'understand' each other. As there are various platforms available to integrate the smart devices, it creates major complexity for developers.

RFID Tags: RFID is an Identification and tracking technology in which digital information about a physical object is stored in RFID tags or smart labels and are captured by a RFID reader with the help of Radio waves. RFID Tags are made up of a chip and antenna (in active tags), and the packaging holds the two together. The RFID tags which are passive are powered by a RFID reader from a distance by broadcasting energy using the antenna. The reader then converts the radio waves to a more usable form of data. The information collected from the tags is then transferred to a host computer system, where the data can be stored in a database and analyzed later.

Practical Applications IoT: ***Smart Home*** is ranked as highest Internet of Things application. The IoT Analytics company database for Smart Home includes 256 companies and startups. The total amount of funding for Smart Home startups currently exceeds $2.5 Billion. A smart home can be described as the one with voice or app-controlled lights, door locks, thermostats, door sensors, motion sensors, smart switches, smart plugs and many other features. More and more people are becoming aware of the ability to make their homes truly smart and green by utilizing home controllers to increase energy and utility bill savings by controlling lighting and by monitoring usage through dashboards. Many smart home device companies have built-in monitoring systems whereby they calculate and log usage by all connected devices, making the home owner aware of the energy usage and utility bills and the knowledge to make changes as necessary. Other IoT applications include Wearables, Smart City, Smart grids, Industrial internet, connected car, Connected Health, Smart retail, Smart supply chain, Smart farming.
Along with the consumer application, IOT has enormous potential in the industrial and business sector as well. It can be used in non-consumer applications like smart cities, smart hospitals, smart power grids, retail, supply chain and military applications. This will help us manage our resources efficiently and will increase convenience in our day to day lives.

Future Scope of IoT: The future of IoT is tremendously bright as technology is developing day by day and Internet will be accessible to most of the people in the future. IoT will drive outstanding developments in the way our food is grown, stored and distributed. The power companies would read meters through telemetering systems instead of visiting houses, doctors would remotely monitor the conditions of their patients 24/7 by having the patients use devices at home instead of requiring the patients to stay at hospital, vehicles will automatically display the nearest

parking space. These are scenarios that only existed in science fiction previously. With the coming of age of the Internet of Things, they would become a reality.

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