

Impact of Internet of Things on Society

Vikas Kumar¹,

¹M.Tech C.F.I.S,

Ganga Institute of Technology and Management
Kablana, MDU Rohtak,

Kirti²,

²PHD, Scholar,

Banasthali University,
Rajasthan

Ashish Kumar Sharma³

³Assistant Professor

Department of C.S.E / C.F.I.S,
Ganga Institute of Technology and Management
Kablana, MDU Rohtak,

Abstract - With increasing popularity of the IoT (Internet of Things) and devices getting smarter day by day, this paper presents an idea to reform the Impact of internet of things on society. The Internet of Things (IoT) refers to the use of intelligently connected devices and systems to leverage data gathered by embedded sensors and actuators in machines and other physical objects. IoT is expected to spread rapidly over the coming years and this convergence will unleash a new dimension of services that improve the quality of life of consumers and productivity of enterprises, shows impact of internet of things on society. In many different ways, and it encompasses many aspects of life from connected homes and cities to connected cars and roads, roads to devices that track an individual's behavior and use the data collected for push services. Some mention one trillion Internet-connected devices by 2025 and define mobile phones as the eyes and ears of the applications connecting all of those connected things.

Index Terms— IOT, M2M, Agricultural IOT, GSMA, IOT Ecosystem, Smart Cities, Wireless Sensor

I. INTRODUCTION

The Internet of Things is an rising topic of technical, social, and economic implication. Consumer products like cars and trucks, industrial and utility components, sensors, and other everyday objects which are being combined with Internet connectivity and have powerful data analytic capabilities that promise to transform the way we work, live, and play. Projections for the impact of IoT on the Internet and economy are impressive, with some foreboding as many as 100 billion connected IoT devices and a global economic impact of more than \$11 trillion by 2025.^[1] Now consider that IoT represents the next evolution of the Internet, taking a huge leap in its ability to gather, analyze, and distribute data that we can turn into information, knowledge, and, ultimately, wisdom. In this context, IoT becomes vastly important. Already, IoT projects are under way that promise to close the gap between poor and rich, improve distribution of the world's resources to those who need them most, and help us understand our planet, so we can be more proactive and less reactive. Even so, several barriers exist in the way of IoT development, including the transition to IPv6, having a common set of standards, and developing energy sources for millions—even billions—of minute sensors. However, as businesses, governments, standards bodies, and academia work together to solve these

challenges, IoT will continue to progress. The goal of this paper, therefore, is to educate you in plain and simple terms so you can be well versed in IoT and understand its potential to change everything we know to be true today.^[2] Let's talk about some other related terms to IoT like M2M.

Machine to Machine (M2M) solutions - a subset of the IoT - already use wireless networks to connect devices to each other and the Internet, with minimal direct human interference, for deliver services which meet the needs of a wide range of industries. In 2013, M2M connections accounted for 2.8% of global mobile connections which were about 195 million, it indicates that this sector is still at a comparatively early stage in its development. An evolution of M2M, the IoT symbolize the coordination of multiple vendors' machines, devices and appliances connected to the Internet through multiple networks. While the potential impact of the IoT is considerable, a cooperative effort is required to move beyond this early stage. In order to optimize the development of the market, a common understanding of the discrete nature of the opportunity is required. To achieve this, mobile operators have identified the following classifiable features:

- The Internet of Things can enable the next wave of life-enhancing services across several fundamental sectors of the economy.
- Meeting the needs of customers may require global distribution models and consistent global services.
- The Internet of Things presents an opportunity for new commercial models to support mass global deployments.
- The majority of revenue will arise from the provision of value-added services and mobile operators are building new capabilities to enable these new service areas.
- Device and application behavior will place new and varying demands on mobile networks.

II. IMPACT OF IOT SERVICES - THE CONNECTED LIFE

A. Review Stage

The Internet of Things (IoT) is defined in many different ways, and it comprehend many aspects of life from connected homes and cities to connected cars and roads, roads with devices that track an individual’s behavior and use that data which is collected for push services. Some mention one trillion Internet-connected devices by 2025 and define mobile phones perform as eyes and ears of the applications which are connecting all of those connected things. Mobile networks already deliver connectivity to a broad range of devices, enabling the development of innovative new services and applications. This new phase of connectivity is going beyond tablets and laptops; to connected cars and buildings; TVs and game consoles; smart meters and traffic control; with the prognosis of intelligently connecting almost anything and anyone. This is what the GSMA refers to as the “Connected Life”. By these internet of things billions objects can communicate all over the world, over a public, private internet protocol network In 2010, the number of everyday physical objects and devices connected to the Internet was around 12.5 billion. This Internet of Things - a widely distributed, locally intelligent network of very smart devices - which will enable extensions and enhancements to fundamental services in education, health and other sectors, as well as providing a new ecosystem for application development.



In 2013, M2M connections accounted for 2.8% of global mobile connections, indicating that the sector is still at a relatively early stage in its development. There are significant regional variations between more established markets, such as Europe, North America and Oceania, where M2M’s share of total connections exceeds the global average, and rapidly developing markets, such as Asia, which have experienced annual growth of 55% a year between 2010 and 2013.^[3]

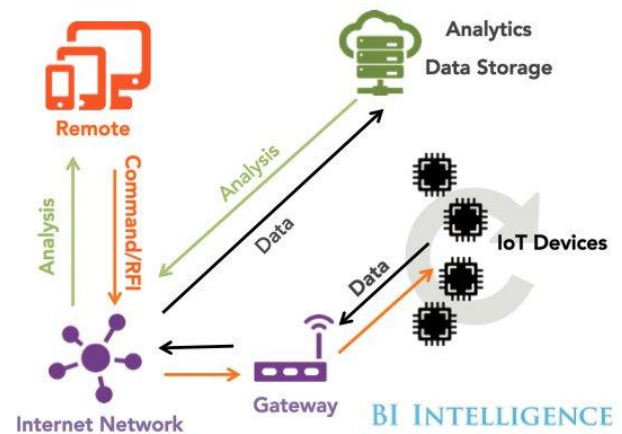
Market forecasts indicate that by 2020, the number of connected devices in the world will almost triple from more than nine billion today to 25.6 billion. Of these, 10.5 billion will connect using mobile technology, with a dedicated SIM and a connection to a mobile network. The remaining devices will use alternative communication technologies, such as short-range radio connections to a communications gateway, Wide Area Network (WAN) radio, fixed line telecommunications or Wi-Fi Network.

III. CONSUMER AND SOCIO-ECONOMIC IMPACT

Universal connectivity between people and processes will enable multiple services to be delivered automatically and contextually, wherever and whenever required, ushering in the Connected Life. Supported by cross-industry collaboration, the Connected Life will have a positive impact on many types of fields like, sectors of the economy, such as automotive, shipping and logistics, healthcare and utilities, potentially benefitting billions of people globally.

As the Connected Life will have a fundamental impact on the way of live and work, there will also be major social and environmental benefits like, improved healthcare, safer and more efficient transportation and logistics, better education and more efficient use of energy. With the facility to capture real-time usage information and provide remote control, embedded mobile connectivity can make a wide range of devices, machines and vehicles more effective and efficient, dramatically reducing waste and improving time productivity^[4]

The Internet of Things Ecosystem



These type of services will also contribute to economic growth by creating new business opportunities for mobile operators, equipment vendors and other players in the mobile ecosystem as well as in adjacent industries. They will represent a very important demand-side inputs which will helps finance the deployment of upgraded mobile networks able to provide IOT and broadband connectivity all around the world. The market of connected devices will open-up new revenue streams, alleviate new business models, drive efficiencies and improve the way of present services across many different sectors are delivered. The global business impact of the Connected Life can be divided into two broad categories: ‘new revenue opportunities’ and ‘cost reduction and service improvements, Such as.

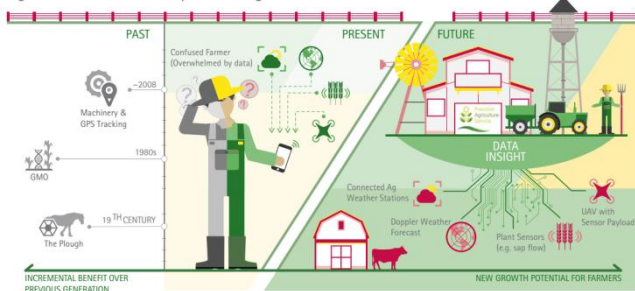
- In 2020, revenues from the sale of connected devices and services, and revenues from related services, such as pay-as-you-drive car insurance, will be worth US\$2.5 trillion, US\$1.2 trillion of which could be addressed by mobile operators and the remainder by the broader Connected Life ecosystem.

■ Cost reductions and service improvements will relate to less direct, but palpable, benefits to organizations, governments and consumers by the evolution of the Connected Life. In 2020, this could be worth approximately US\$2 trillion: US\$1 trillion from cost reductions, just like smart meters removing the need for manual meter readings; and US\$1 trillion from service improvements, such as clinical remote monitoring for patients with chronic illnesses.

IV. IMPACT OF IOT IN AGRICULTURE

Due to the development of society, traditional forms of agriculture can't satisfy people's needs, so agriculture must be change to satisfy people's needs. The development of Internet technology has brought great opportunity for the development of agricultural modernization, agricultural Internet of things has become the inevitable trend of agricultural informatization. With the help of remote monitoring and control of greenhouse, the greenhouse monitoring system realized the precise measurement and real time control of the greenhouse.

Figure 1: The evolution of (precision) agriculture



Also the greenhouse monitoring system can implement the scientific management methods, improve the situation of crop disaster prevention ability and increase production. The greenhouse monitoring system is designed to satisfy the need of the remote monitoring and control of greenhouse. The IOT gateway is a join point of public network and wireless sensor network in greenhouse monitoring and control system. And the function of the gateway is to gathering data, upload and processing remote user control information. The gateway is based on modularization method and the using of the method to improve the compatibility and better meets the needs of complex agricultural environment.

In agricultural Internet of things Because of the electric and network is instability, the design can realize the cable and wireless communication between the gateway and the upper computer, if all the network lose connection, then the data will be stored in the SD card, and send to the upper computer when established network connection.^[5]

V. IOT FOR HEALTHCARE

The concept of smart healthcare plays a significant role in healthcare applications through embedding sensors and actuators in patients and their medicine for monitoring and tracking purposes. The IoT is used by clinical care to monitoring physiological statuses of patients through sensors by collecting and analyzing their information and then sending that analyzed patient's data remotely to processing

centers for perform suitable actions.

For example, Masimo Radical-7 monitors the patient's status remotely and reports that to a clinical staff. Recently, IBM utilized RFID technology at one of OhioHealth's hospitals to track hand washing after checking each patient. That operation could be used to avoid infections which cause about 90 000 deaths and losing about \$30 billion annually. Generally in the case of accidents someone has must intimate to the hospital for getting ambulance, but in the world of IoT whenever accidents are takes place, the wearable devices automatically gives signal to nearest Wi-Fi router and then hospitals to get the ambulance, based upon patient's health conditions like heartbeats.^[6]

IoT can be used to supplement patient treatment through remote monitoring and communication, and to keep track of patients as they move through a healthcare facility. Read on to discover the specifics of these IoT deployments.

Hospitalized patients whose physiological condition requires close attention can be constantly monitored by IoT-driven, noninvasive monitoring. This type of solution Employs sensors to collect comprehensive physiological information and uses gateways and the cloud to analyze and store the information and then send all the analyzed data wirelessly to it's right place for further analysis and review. It replaces the process of having a health professional to come by at regular intervals to check the patient's vital signs, instead providing a continuous automated flow of information. In this way, it simultaneously improves the quality of care through constant attention and also lowers the cost of care by eliminating the need for a caregiver to actively engage in data collection and analysis. The people all over the world whose health may suffer because they don't have ready access to effective health monitoring. But small, powerful wireless solutions connected through the IoT are now making it possible for monitoring to come to these patients instead of vice-versa. These type of solutions can be used to securely capture patient health data by a variety of sensors, apply complex algorithms to analyze the data and then share it through wireless connectivity with medical professionals who can make appropriate health recommendations.

Smart sensors, which combine with other sensors and a microcontroller, make it possible to harness the power of the IoT for healthcare by accurately measuring, monitoring and analyzing a variety of health status indicators. These can include basic vital signs such as heart rate and blood pressure, as well as levels of glucose or oxygen saturation in the blood. Smart sensors can even be incorporated into pill bottles and connected to the network to indicate whether a patient has taken a scheduled dose of medication.

VI. CONCLUSION

The Internet of Things is a hope to deliver a step change in individuals' quality of life and enterprises' productivity. With help of widely distributed, locally intelligent network of smart devices, the IoT has the power to enable extensions and enhancements to fundamental services in transportation, logistics, security, utilities, education, healthcare and other

areas also, while providing a new ecosystem for application development. There is need of concerted effort to move the industry beyond the early stages of market development towards maturity, driven by common understanding of the distinct nature of the opportunity. This market has distinct characteristics in the areas of service distribution, business and charging models also, capabilities required to deliver IoT services, and the differing demands these services will place on mobile networks. GSMA's Connected Living Programme is an industry initiative which seeks to hasten of the development of mobile-enabled IoT services. It is hoped that a common understanding of the characteristics of IoT will enable industry stakeholders to collaborate more effectively in order to propel the market forward for the benefit of consumers and society.

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